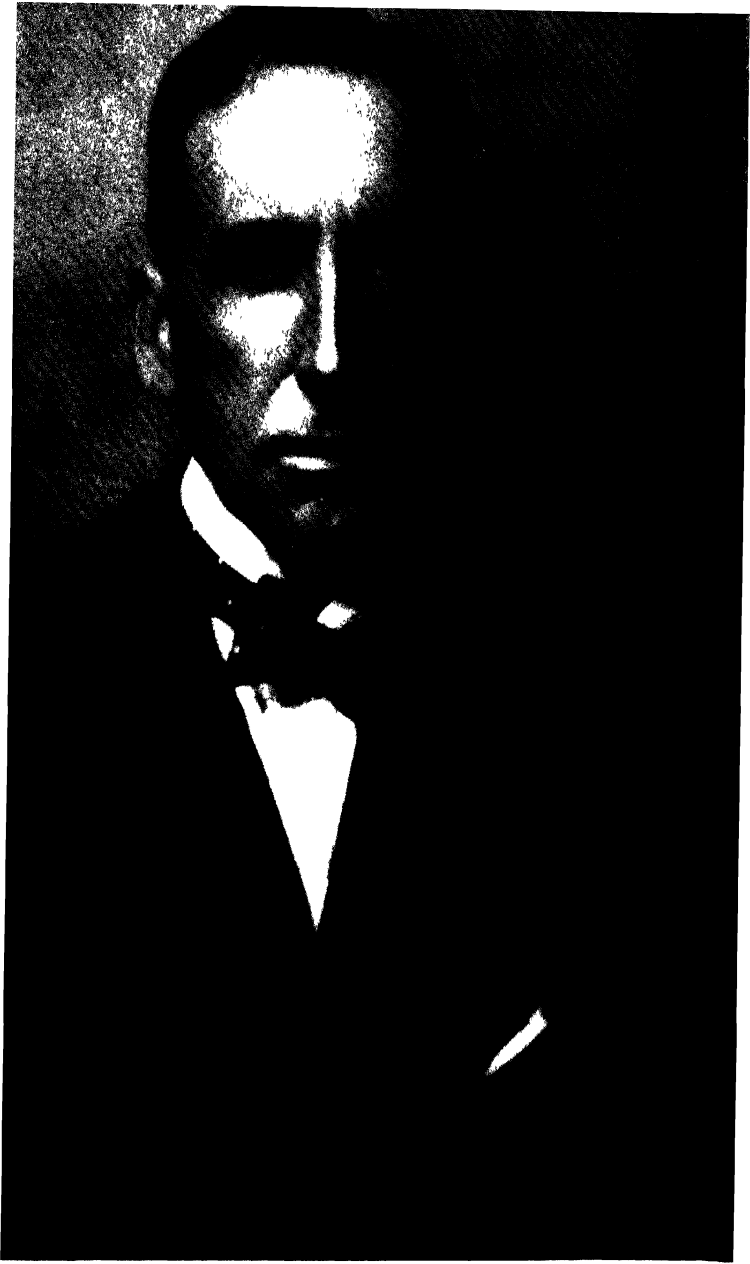


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SOME AFRICAN MILESTONES

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SOME AFRICAN MILESTONES

By

H. F. VARIAN, M.I.C.E., F.R.G.S.

(Late Chief Resident Engineer, Construction,
The Benguela Railway, Angola)

With a Preface by

LIEUT.-COL. EWART S. GROGAN, D.S.O.



GEORGE RONALD

WHEATLEY

OXFORD

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To
MATT AND HONOR

PREFACE

WHEN my old friend Varian asked me to write a preface to this book, it required quite an effort to throw my mind back fifty-four years to the days when he and I, as youngsters, joined in the battle for the defeat of Africa. In these soft days it is difficult to revisualise African life as it was then. Malaria, supposedly an emanation from marshes, was a continuous feature. Food for a trooper in the Matabele campaign consisted of bully-beef, in tins more often than not blown, and an egg-cup of mouldy rice eked out with an occasional full meal on vulture, stalked on the previous day's battlefield and surreptitiously grilled under cover of the nearest kopje, the whole enlivened from time to time by the issue of a ferocious form of brandy called 'dop'. Bed consisted of the ground, tempered if one was lucky by a ground sheet and a blanket, and cover was the sky. No one squealed and no one regarded these circumstances as other than the norm of adventurous life which was the general ambition of Victorian youth.

In these hesitant days of vitamins, balanced rations, caloric requirements and what not it seems incredible that such a large proportion of that gay band of adventurers survived for a full and productive life.

Pre-eminent in my memory as the symbol of that dynamic half-century is the figure of Alfred Lawley of the firm of Pauling. He and his hospitality, consisting of trainloads of food and drink, acted as a veritable Panzer Division in forcing railways at speed through the physical reluctances of the African veld.

In 1896, railhead from the south was Mafeking and from the east there was the construction headquarters at Fontesvilla with an annual death rate alleged to be 75%. Now, it only remains for the linking of Broken Hill with the Kenya-Tanganyika system to complete the steel web.

Throughout this period of great endeavour Varian has

PREFACE

played an essential and unpretentious part and there are few sections of this astounding triumph over difficulties which are not a memorial to his energy and skill. Only yesterday he has left his mark on Kenya by locating the most spectacular section of the new highway towards Uganda aptly described as "the Varian Way" and he is still going strong apparently, "The Inexhaustible", ready for any new task that may arise.

Taveta, Kenya.

EWART S. GROGAN

I.I.52.

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The big picture of the Victoria Falls Bridge, facing p. 105, was taken by *The Aircraft Operating Co. of Africa Ltd.*

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INTRODUCTION

THIS book is an endeavour to sketch the development, at the turn of the century, of those lines of penetration through Africa known as "Pioneer Railways." They were so-called because of their style and method of construction. The spirit behind them was the spirit that gave Britain an empire. Their early history is linked with that of Cecil John Rhodes and his colleagues, who dreamed of opening up the vast hinterland of Africa, and whose energy and enterprise made this dream come true.

Rhodes and his circle were not alone in their vision. Other European powers in the sub-continent shared this realisation of the importance of communications from the coast to the interior.

Parallel to the drive through British territories, the distinguished Portuguese patriot and administrator, General Joaquim José Machado, embarked on similar development in Portuguese East Africa. His name and work are perpetuated both there as well as in Portuguese West Africa. For his collaboration with the British in these projects, he was awarded the K.C.M.G. It remained for Robert Williams (afterwards Sir Robert Williams, Bt.), on whom fell the mantle of Rhodes, and in fulfilment of his promise to him, to continue the work to the north.

Later, in the Belgian Congo, the controllers of financial and mining interests there were responsible for the extension of these lines to Port Francqui (Ilebo) on the highest navigable point on the Casai River, above its junction with the Congo, just south of the Equator.

These combined railway-systems, together with their feeder lines to the east and west coasts of Africa, now form that network which has been instrumental in the expansion and settlement of the country between Capetown in the south, and the Congo River in the north.

INTRODUCTION

The construction of this chain of railways began in the early nineties of the last century. It continued, with occasional unavoidable delays, until the lines reached the Congo River and the west coast of Africa in the early thirties of this century.

This book is an attempt to show how, when, and why these railways were built, and to recount some of the difficulties in construction and finance that beset their path. It is not intended to be a treatise on railways, or a guide book, or even one of adventure in its accepted sense. Life on the perimeter of civilisation can be just as prosaic as at the centre. There may have been times of stress and excitement, incidental to life in the remoter parts of Africa, but these were naturally spread over long periods.

After all, launching oneself into the stream of traffic in Piccadilly is just as dangerous and venturesome as being in the way of an advancing elephant or rhinoceros; in fact in the latter case, there is a more sporting chance of coming out alive. It may be said of Africa, in the early days, as the Misses Somerville and Ross say of Ireland in *The Experiences of an Irish R.M.*: “. . . the inevitable never happens, the impossible invariably occurs . . .”

The railways of this story run across the Central African Plateau, with its eternal stretches of bush and scrub, for the most part extremely dreary. The setting only becomes spectacular on descent from the plateau into the lower country, or towards the coast. Yet the lives of those who worked on the surveys or construction of the lines over periods of many years could hardly be described as monotonous. Africa can always be relied on to produce a diversion.

The facts and figures of this book are inevitably intermingled with personal reminiscence, in which there is no intention of personal merit. In the accomplishment of such great tasks, there is no question of individual effort. Success was only possible by reason of the loyal co-operation and combined efforts of those who believed in and carried out the far-sighted dream of great men of Empire.

Information other than personal has been gathered from various sources. For the earlier days of the Cape Government

INTRODUCTION

Railways, I am indebted to the papers of my late chief, Sir Charles Metcalfe, Bt., and to conversations with him. Sir Charles, as the friend of Cecil Rhodes, worked with him in all the original schemes of the Cape-to-Cairo Railway.

I must acknowledge my grateful thanks to Mrs. Yvonne Lambert for her generous assistance in helping me to arrange my MSS., and also to Miss Sybil Weir, and Mr. Leonard Neame, for their kindly advice.

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H. F. VARIAN.

CHAPTER I

EARLY DAYS

TOWARDS the end of the nineteenth century, and at the beginning of the twentieth, the final territories were added to the British Empire, as it was then proudly called.

India, Canada, Australia and many lesser possessions had been acquired in every corner of the globe; but in Africa, no great additions had been made beyond the few scattered colonies of the west coast, and the Cape Colony and Natal in the south. It was not until the coming of Cecil Rhodes, last of the great Empire builders, that South Central and Central Africa were incorporated as links in the imperial chain.

Prior to the outbreak of World War I, most of the territories of Africa remained unsurveyed and ill-defined, their frontiers still uncertain. There were few settlers. The shifting European population consisted of missionaries, prospectors, traders, remittance men, and other members of "the Legion that never was listed".

These were the days of big game hunters who sought and killed their game on foot with black powder weapons, as opposed to their modern counterparts who hunt with motor transport and high velocity rifles. They were also the days of unlimited slaughter, before a more enlightened era of licences and game conservation.

Elephant hunters, poachers and ivory traders penetrated unhealthy outlying districts which would otherwise have remained unexplored. The knowledge gained by these early wanderers led to the settlement and eventual subjection to civilisation of the enormous inland tracts of Africa.

But during the time of these final additions to the Empire, the germs of dissolution were already forming within it, as in all bodies. Behind the pioneers who built it, those of a lesser breed and a more sheltered life were already working towards

its downfall, though their own welfare derived largely from the great heritage so hardly won by their forbears. At last, when power was sought on other issues—though it is doubtful whether such power would have been gained had the consequent disintegration of Empire been foreshadowed—this achievement of many centuries was virtually destroyed in as many years. The once far-flung Empire could not be flung far enough to satisfy the back-room theories and untried doctrines of its heirs.

.

At that period, transport in Central Africa was still dependent on the native porter and the ox-wagon. The pioneer type of railway, which was to play such an important part in the eventual illumination of the "dark continent", was still in its infancy.

Down the centuries, inland transport had relied on native porters and carriers, limited in carrying capacity, but flexible and fast. The ox-wagon which followed in the travel sequence had serious limitations. It necessitated roads, however rough, drifts at river crossings, and a reasonable amount of feed for the cattle at the outspans. In addition, its use was only possible in country where there was no tsetse fly. The boundaries of fly-free country could only be determined by personal experience, and such experience was usually gained, as in the case of the intrepid Boer voortrekkers, at great personal loss.

The main lines of communication in Central Africa have been well defined through the ages, following in general the line of least resistance. No important routes existed from north to south, but great trans-continental highways ran from west to east along the principal trade and slave routes.

The northern highway extended from the Niger River on the west coast, past Lake Chad to the various Red Sea ports, by-passing the obstacles of the equatorial forests and the Great Lakes. This was also a pilgrim route to Mecca.

The chief southern routes, from Zanzibar and the coastal towns of the East African territories, converged on the

Zambesi-Congo watershed, tapping on the way the great reservoir of slaves on the Casai River and in the Congo River basin, and continuing to the ports of the western seaboard. This route probably served the slave traffic to North America. Much folk-lore from these territories still exists among the American Negroes, notably the legend of Brer Fox. There is also evidence along the route itself, in the current use of Arabic words foreign to the local Bantu.

Both northern and southern highways ran through considerable stretches of country infested with tsetse fly. It can therefore be assumed that here the only means of transport was by native carrier, in contrast to the camel caravans of the north and the "turning wheels" of the south.

The rates of progress of these forms of transport varied considerably. The native porter's performance depended on the character of the country and the load he carried. With a load of from sixty to seventy pounds, he could average fifteen miles a day, sometimes twenty. The ox-wagon, fully loaded, could maintain an average of twelve to fourteen miles a day, with two outspans, in dry weather. In wet weather, yoke galling restricts travel.

The fastest means of travel at the turn of the century was possibly the Cape cart, drawn by mules or horses. In districts served by roads, these would average thirty-five miles a day over long distances. The famous Zeederberg mail-coaches which preceded the railway from South Africa to Rhodesia could do one hundred and fifty miles or more, depending on weather conditions, in a twenty-four hours' run, carrying ten passengers and a ton of mail and baggage through day and night, with constant changes of mules.

Third in the travel sequence came the railway—most important of all. Subsequent motor and air transport may supplant it in some ways, but can never compete in the field of bulk transport, on which the main body of commerce depends.

In the last fifty years, the railway and its successors, the motor vehicle and aeroplane, have made the old forms of travel in Africa obsolete, except in the remotest parts. This is

inevitable in a changing world of ever-increasing speed. But many who knew life at its more leisured pace regret the passing of these symbols of another age, when men could work with purpose, and Africa in her simplicity and freedom seemed close to Eden.

It was my fortunate fate to know Africa in these early days, and to play a part in the later stages of development of the railway system, which followed the porter and the ox-wagon, through South and Central Africa, bringing civilisation and progress in its wake.

Immortal Mr. Jorrocks, in one of his many quotable sayings, once remarked that "there are two sorts of knowledge; one that you carry in your head, and one that you know where to find". For this first type of knowledge concerning my story, I draw on my own recollections. For information on the early development of the railway system, before my association with it, my main source has been my old chief, Sir Charles Metcalfe, Bt., close friend of Cecil Rhodes and well-known pioneer engineer, later of the engineering firm of Sir Douglas Fox and Partners, and Sir Charles Metcalfe, Bt., who were the Consulting Engineers for the whole of the Rhodesia, Beira and Benguela railway systems.

It was through Sir Charles that I became connected with those railways. With the exception of four years in the Royal Engineers during World War I, I had over thirty years' service of survey and construction on those lines, in later years representing the Consulting Engineers in Africa.

Sir Charles was a man of boundless energy; he had that gift of "an eye for country" which is so essential in a pioneer railway engineer. From him I gained knowledge that stood me in good stead in later years, while from his conversation and recollections, as well as his papers, technical and otherwise, I have been able to gather data concerning the earlier developments of railways in Africa, and in South Africa in particular.

Although I only arrived in the tail of the hunt, as it were, looking back on those years of interest and adventure I have always considered how lucky I was to play a part in these

projects, and to have been in at the finish. It was entirely chance that led me out to Africa—one of those inexplicable matters of Fate where the misplacement of even the smallest link would have resulted in a completely different destiny.

Everyone has an appointed place in the scheme of things. Some are ordained to live in communities, others to butt into the wilderness where there is less profit but a greater dividend in action and interest. Wherever you find yourself, especially in Africa, it is as well to be an opportunist and make the most of your circumstances. My old gun-bearer, Alexander, expressed this idea in a phrase that has remained with me for many years. As Alexander will appear again on the scene, he must be given his background.

Alexander was an African from the Gold Coast. With other compatriots, he arrived in Angola in the early days of the construction of the Benguela Railway during a period of labour shortage. He was a born hunter, and a clever naturalist. In his unassuming way, he could explain the why and wherefore of anything that walked, flew or crawled in the bush. He would do this in his quiet, slow West African pidgin English, as thoroughly and simply as if he were talking to a child. He only shared his knowledge on request, but my requests were frequent, and I gained from him an insight into the things about me which I could never otherwise have done.

One day during our wanderings, we found a honey-bird, followed him to the honey, and gave the guide his share in the customary way. Over the fire that evening we discussed the day's events, dwelling on the habits of the honey-bird, and the many legends told of it. Eventually I asked Alexander why this particular bird should do such things, while many others with the same tastes do not.

There was a long silence. I thought for once I had him at a loss for an answer. Then came the slow reply:

"It's the work God gie 'im."

I could find no argument against this, and it expresses perfectly what I have tried to convey above on the subject of personal destiny.

In my own case, "the work God gie 'im," laid before me in

1898, was extremely nebulous. It held no suggestion of the life that was to materialise later for me in Africa, although Africa itself, with its open air existence, big game, and wild spaces, had been one of my life's dreams.

My late father had distinguished himself as an elephant hunter in Ceylon in the 'seventies. In 1875, the year before I was born, he was detailed to accompany the Prince of Wales (afterwards King Edward VII) to shoot his first elephant in Ceylon.¹ The son of a not-so-rich Irish family, he was at that time in the Woods and Forests Department of the Northern Province of Ceylon. Subsequent encounters with elephant and buffalo, in those days of the muzzle-loading .4 and .8 bore rifles, accelerated his early death at the age of thirty-four, in 1882. This did not improve the family fortunes. My mother, one of the finest of God's women, had previously returned to England, and was left to battle alone with the upbringing of a young family.

In the circumstances, I was given a special nomination on the engineering side of the Public Works Department in the Civil Service of Ceylon. I had to prepare to face the necessary examinations, and was well away with my studies, the groundwork of which was invaluable to me later; but before I could take up my nomination, we reached the bottom of the till of the family exchequer, and I had to give up the idea.

At that time, the future seemed very blank. I was not to know that for me it was a blessing in disguise. I might have become a local civil servant, with the lack of initiative and opportunity associated with such beings. Instead of this circumscribed background, I got the whole wide range of Southern Africa.

Then came a chance of going out to Burma with the Burma Teak Forest Company. I never knew exactly in what capacity, but it meant the end of the engineering future for which I had been working.

At that time, I was lucky in having some very good friends, the Archer-Burton family in Hampshire. Vivian Archer-Burton, though older than I, was a particular friend. James,

¹ See chapter 12, p. 245.

his elder brother, was an adventurous spirit who had spent some of his youth in America in the wicked days of the "Wild West". He was a dead shot with a revolver, and could "fan" one with the trigger removed in a way I had read about but never hoped to see.

James had just come home, suffering from a bad wound received in the Mazoe Patrol during the Mashonaland rebellion. The incident of the Mazoe Patrol, possibly now forgotten, was acclaimed at the time as a very gallant action.

During the early stages of the Mashona rising, the country around the Alice Mine, some thirty miles from Salisbury, was a particularly bad spot. For mutual protection, the few Europeans in the district concentrated on the kopje which was the mine itself. Here they were besieged for several days. The party consisted of half a dozen men and two women, and included Mr. and Mrs. Salthouse of the nearby Salvation Army Mission.

The position became desperate, and it seemed only a matter of hours before the finish. It was decided to make a dash for Salisbury through the Mashonas who swarmed in the long grass, close enough for their threats to be clearly audible. There was a light wagon and mules at the mine. The besieged party armoured the wagon with sheets of boiler plating, and decided to make the break at dawn.

In the meantime, on the previous evening, five young men led by Hendriks of the Bechuanaland Trading Company of Pioneer Street, Salisbury, hearing of the trouble at the mine, decided to ride out and give a hand. By the time they arrived, the siege had closed in and they were themselves besieged with the others.

The break through was made at dawn as arranged, along the road lined with long grass on either side. This gave good cover to the attacking natives, who were armed with rifles, and who concentrated first on killing the mules. As the mules were killed, the little party replaced them with the animals ridden out the day before from Salisbury.

During one of these enforced delays, while James Archer-Burton was cutting a dead mule out of the traces, he was shot

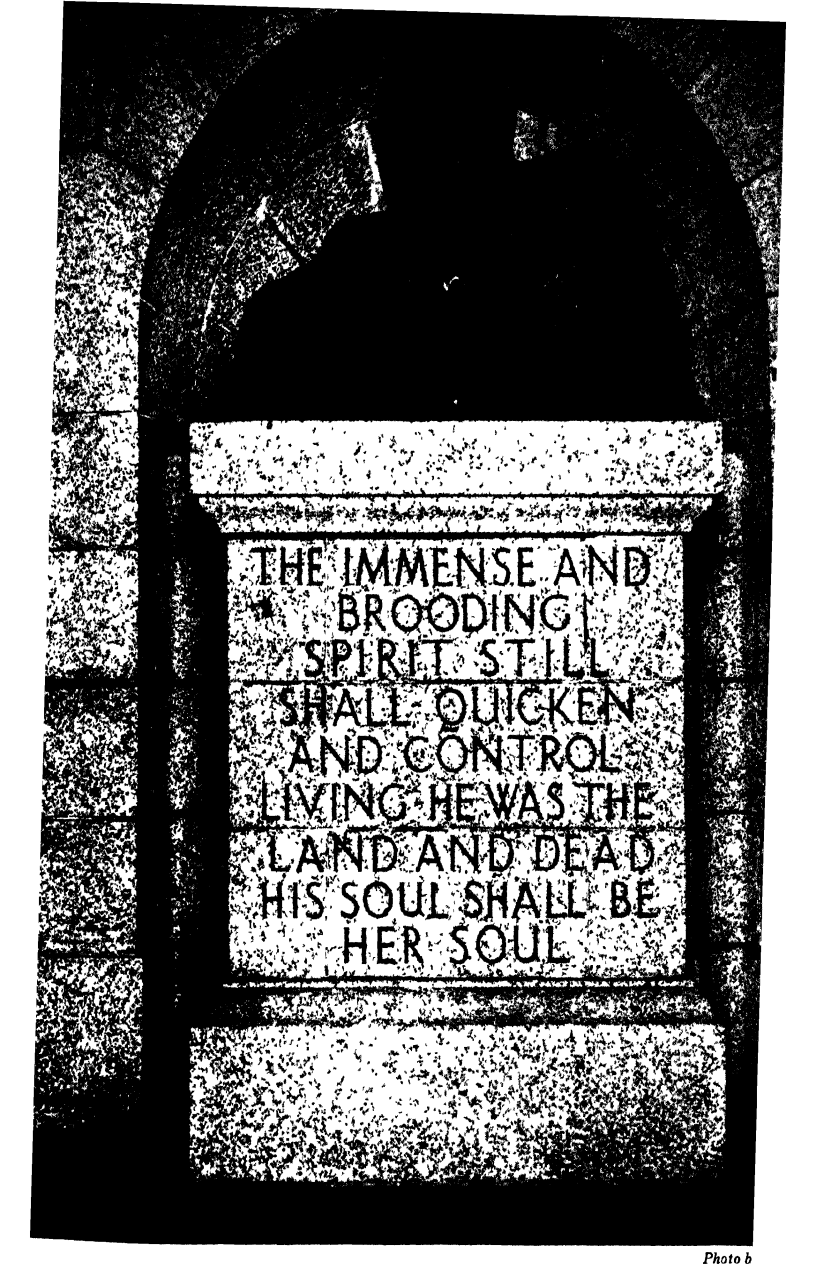
through the head at short range by a native hiding in the grass. The shot took off the lobe of his left ear, passed through the roof of his mouth, and emerged below the right eye. Had the range been further, the bullet would have expanded sufficiently to have finished him; it was evidently the leaden bullet of a Martini rifle.

While the others held off the attackers, Mrs. Salthouse left the shelter of the armoured part of the wagon, and managed to pull him in. For want of bandages she tore up a petticoat and bound him up sufficiently to stop the bleeding, thereby saving his life.

By that time, other runners had reached Salisbury with reports of the serious situation. The number of rebels was now so great that it was hopeless to try and get through without a large armed force. With only a forlorn hope of success, Captain Nesbitt of the Police, accompanied by other volunteers, started out from Salisbury, and eventually met and relieved the remainder of the little party on the road. For this action he received the V.C.

Jimmie Archer-Burton, when he had recovered from his wounds, was anxious to get back to Mashonaland, and had persuaded his brother Vivian to accompany him. A friend of theirs had recently returned from Africa, and his stories stirred my interest. This was Cyril Hoste, brother of the famous "Skipper" Hoste of the original Pioneer Column to Mashonaland in 1890.

Cyril had spent three years with the Weston-Jarvis Expedition in the country north of the Zambesi, as its leader during its latter years. (The original leader was Dr. Murphy.) This prospecting expedition was fitted out in England in 1895, and sent to investigate a mineral concession in the Loangwa River district. It spent three years in Angoniland and the neighbouring country to the west, with only disappointing results, though from Cyril's account the western travels must have run very close to the great copper belt of Rhodesia and the Katanga, discovered a few years later by George Grey, leader of the expedition sent out by Robert Williams of Tanganyika Concessions.



THE IMMENSE AND
BROODING
SPIRIT STILL
SHALL QUICKEN
AND CONTROL
LIVING HE WAS THE
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HIS SOUL SHALL BE
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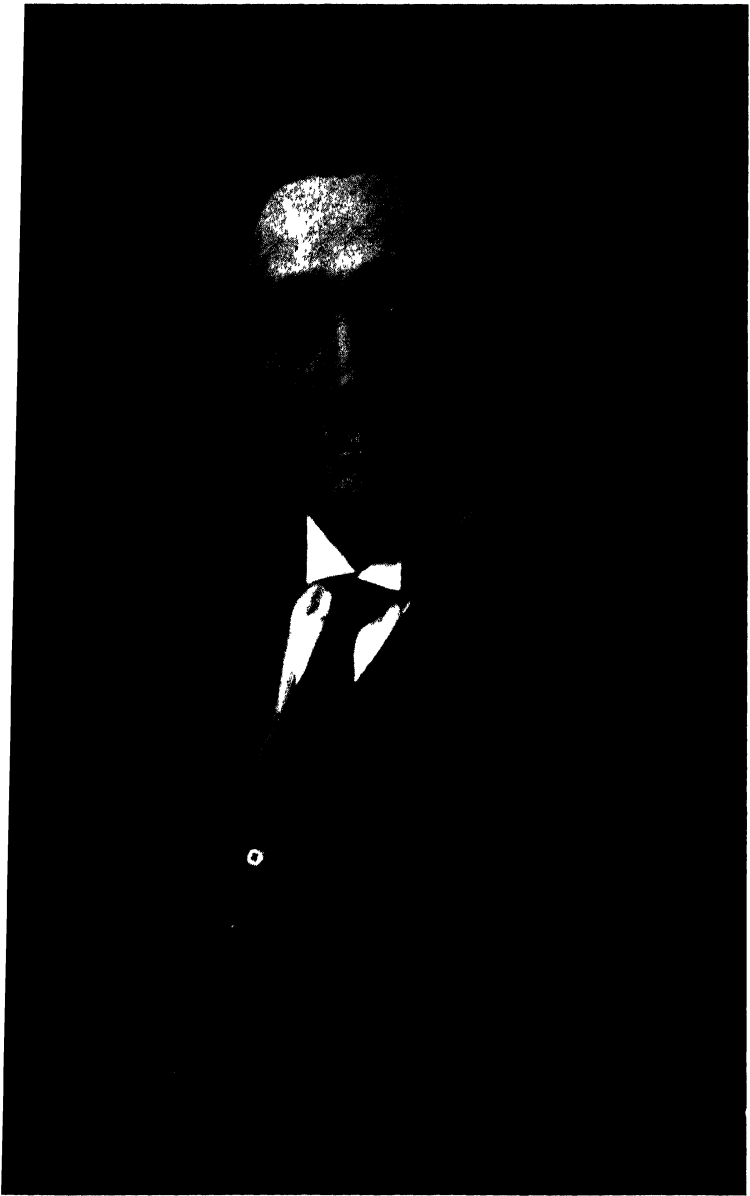
Photo by Cape Times



Photo by Cape Times

“The ox-wagon, fully loaded, could maintain an average of twelve to fourteen miles a day, with two outspans, in dry weather.”





SIR ROBERT WILLIAMS, BART.

During the winter of early 1898, we all used to run with a private pack of Bassett hounds belonging to Jack Moss of Winters Hill Hall, Bishops Waltham, a brother-in-law of the Archer-Burtons. During this time I learnt more and more of Africa, and my desire to see it for myself grew in proportion to all I heard.

Although the rebellion was still smouldering, my three friends, Jimmie, Vivian and Cyril, decided to return together to Mashonaland, in the near future. Jimmie wanted to try his luck starting a trading store on the Hunyani River Drift near the Poort, then known as "Norton's Poort", twenty miles from Salisbury. It was here that the whole Norton family were murdered during the rising.

Cyril and Vivian intended to go north of the Zambesi to Angoniland, to trade cattle in the rich pastoral district Cyril had discovered during his travel, and bring beasts down to Salisbury. Fresh meat at that time, after the rinderpest, was at a premium, while bully beef was two and sixpence a tin, so they seemed to be on a good wicket with this scheme.

It was getting near the time for their departure, and in addition to my natural regrets at losing them, I was most envious of their prospects, particularly as my own were so very uncertain. I was trudging home with the hounds one day, as acting whip, in Cyril's company, when suddenly he asked me why I did not join them.

I explained my position to him, telling him of my early hopes for an engineering career, and how I had worked towards this, but had had to give up the idea. I told him that I was at present at a loose end, and considering a chance with the Burma Teak Company, but that this was still indefinite. Cyril replied that although there was not much doing as yet in Mashonaland (it had not yet got used to its new name of Rhodesia), with the end of the rinderpest and the native rising there was bound to be a future for anyone of my age—I had turned twenty-one—and with my knowledge, who was prepared to work hard and take what came. The others joined in his persuasions.

With scrapings and borrowings in which they all kindly lent

a hand, finances were arranged, and with astonishing rapidity I found myself launched on the unknown.

My last night in London, which I was not to see for another six years, was memorable. Marie Lloyd and Little Tich were on at the Pavilion, then London's supreme music hall. From the Pavilion, we went to St. James's Restaurant—"Jimmie's"—which was replaced during my absence abroad by the Piccadilly Hotel.

We rode to the Grosvenor Hotel, where we spent our last night, in one of the ten electric cabs which were then the latest thing on the streets of London. (Even in 1904, the year of my next visit, the "motor cabs" which replaced them were restricted to the use of two stands only, one at Knightsbridge, and the other at Trafalgar Square.)

We journeyed across Europe by train, and joined at Naples the S.S. *Koenig*, a vessel of some 5,000 tons. She and her sister ship, the *Herzog*, both new to the run, were then the largest ships sailing down the east coast of Africa. The break with the old life was thus smoothly accomplished, and the new life opened, bright with promise.

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We arrived at Beira, in Portuguese East Africa, on the 24th May—Queen Victoria's birthday. The occasion was being suitably celebrated by Her Majesty's local subjects, at a party given by H.B.M. Consul, Mr. Greville-Maugham, who had recently been transferred there from Zanzibar.

The town was the headquarters for the construction of the 2' Beira Railway. Money was plentiful, and other distractions were few. Little excuse was needed to emphasise the wetter side of life, and our introduction was a convivial one.

Beira at that time consisted of a long, straggling street lined by wood and iron buildings, with a concrete pavement on each side of the spit of deep sand on which it was sited. The only means of transport were trolleys propelled by natives along a line of 1' 6" decauville track. As all these trolleys were privately owned and there were none for hire, one had to walk everywhere.

From the health point of view, Beira was a place to be avoided. The ill-fame of the town and its surroundings extended well beyond its borders, and we had heard all about it before we arrived, on the way out from England. Our first impressions, confirmed by the fever-stricken look of most of the inhabitants, did nothing to contradict these tales.

The connection between the mosquito and malaria had not yet been discovered. The mangrove swamps of the Cheveve Creek, not yet reclaimed, reached almost to the backs of the houses in the main street. Consequently, the mosquitoes were a constant plague by day and by night.

After several days in Beira, we were lucky enough to obtain a covered truck on the 2' gauge line. We stowed all our baggage and ourselves inside, and then, attached to a goods train, proceeded at a leisurely crawl to cover the 220 miles to the frontier. This was just short of the recently-achieved terminus at New Umtali. The journey took us two days.

The line was being extended as a 3' 6" gauge to Salisbury, 175 miles north-west of Umtali, but it was not yet completed. Transport of goods and passengers beyond Umtali was still dependent on ox-wagon and coach. As Salisbury was our objective, we had to find a wagon transport for the remainder of our journey, a serious problem in that time of scarcity.

The native rising was still smouldering in outlying districts, and wagons were therefore still travelling in convoy. After a few days we had some luck, and managed to join a convoy of five then loading for Salisbury.

More wagons were gradually entering the country, chiefly from South Africa, to replace the many lost during the rising and the rinderpest. These not only added to the competition for transport and for cattle grazing at the outspans, but also had the effect of reducing rates.

We were lucky enough to come in at the reasonable rate of 10/- per 100 lbs. Recently the rate had been £1 for 100 lbs. between Umtali and Salisbury. At one time during the rising, with the acute lack of transport due to loss of cattle from rinderpest, rates had risen as high as £5 per 100 lbs., and of course, before the rails reached Umtali, there were even greater

distances to cover from the railheads to the east, in Portuguese territory. At the height of the epidemic, when oxen were dying in their hundreds along the roads (the pitiful remains were still in evidence as we passed), out of several lightly loaded wagons leaving from the railhead only one perhaps would reach Salisbury carrying the more valuable freight, the remainder having had to be abandoned on the way.

These high wagon rates, added to the £11 per ton charge over the Beira Railway, were not conducive to cheap living for the few European inhabitants of the country. Imported foods were prohibitive. There were no duties, but in 1898 there were extraordinary anomalies in price. For instance, a tin of bully beef cost 2/6, a case of milk 45/-, a case of whisky 42/- (and real whisky at that), while beer for those who could afford it was 7/- a bottle. In the bars, of which there were plenty, a drink meant whisky; beer was a compliment.

On the roads, competition was keen among the transport riders to reach outspans where the feed was good. During the dry season, when veld fires broke out freely and frequently, pasture near the roads was scarce. In some cases, the nearest grazing would be five miles from the outspans, consequently all trekking was done at night.

The usual routine was to inspan at sundown, trek till nine o'clock or later, and then tie up. The yokes were removed from the oxen, and they were made fast by their riems (raw-hide ropes) to the trek-tou, which was the steel rope or chain to which the yokes were attached, and which ran the whole length of the span. This enabled the oxen to lie down in their allotted positions, which never varied after the span had been formed. At 2.30 a.m., an ungodly hour, it was opstaan, inspan, and trek until sunrise, round about 6 a.m., and then outspan for the day. The rate of progress of a well-loaded wagon seldom exceeded two miles an hour, so twelve to fourteen miles in the night was considered good going.

The oxen were away all day feeding, and those at the outspan with the wagons passed the time engaged in their own particular chores, shooting, cooking, or sleeping. There were no such luxuries as tents or even bedsteads. The transport

rider usually had his own bed, a square frame strung with "riempies" of rawhide, carried slung beneath the wagon. The others slept in their blankets on the ground, near or under the wagon. Luck was in when there was a convenient wheel rut to fit one's hip-bone and add to the general comfort. It was a grand free life to look back on from these days of rush and petrol.

Each complete wagon had a span of eighteen oxen, a driver, and a "voorloper" or leader, usually a piccanin or small native boy, who also did duty as herd during the day. In some cases the owner-transport rider drove himself.

Loads varied from 6,000 to 10,000 lbs., according to the type of cargo. As a rough guide, the weight of the oxen in the span was about twice that of the load. The load itself, of whatever kind, was made fast in no uncertain manner by riems. This performance was an art in itself. The riem usually has some of its original hair attached, and there are few things harder on the hands than the slip of a riem during haulage. On a really rough road, the shapes and contortions that a well-loaded wagon could assume and indulge in without disintegration are on my list of unexplained miracles.

Our convoy consisted of five wagons, four of general cargo, and one of five tons of 9" x 3" timber deals, which gave trouble throughout the trip. Such a load is always a difficult one for a wagon in rough country. This was no exception. It had to be off-loaded and replaced after almost every hill or drift, and no application of riems or science in making fast seemed to be able to hold it.

The wagons were loaded in the station yard, and with everything set, we pulled out from Umtali to the outspan, several miles away at the foot of the Christmas Pass. In the years between I have spent countless nights in the open under all conditions in all parts of Africa, but the memory of that first night on the veld has never failed to raise a reminiscent thrill.

Luck was with me in my first impressions. I discovered later that we had arrived in Umtali at the best time of year; so everything conspired to make the night memorable. First

there was a glorious sunset over the mountains of Manicaland, the fabled country of *King Solomon's Mines*. At that season, when the rains are just over and before the bush fires have begun to obscure the landscape with their haze and smoke, the sunsets in the mountainous regions of the Highveld are at their splendid best.

In the short transition from the glare of day to the relief of darkness, the world is lit with indescribable changing hues. Opposite the setting sun, the dark warm chocolate of the plain changes to the blue of mountains set against the deeper blue of the evening sky. Every distant detail stands out in bold relief, almost clear enough to be touched and felt, then gradually disappears into the approaching night. This daily drama, though acted in so short a space of time, was always a source of inspiration, renewing in me something lost during the day, and symbolising the sharp contrasts which are the piquancy of life and make it all worth living.

Before sundown, the more lightly loaded wagons moved forward to tackle the Christmas Pass. This Pass, and possibly the Odzi River drift, were the two greatest obstacles encountered in those days on the road between Umtali and Salisbury. The Pass was worse than the drift, and cordially hated by those who had to cross it.

At that time, the road ran straight up a very steep gradient. By reason of its mode of haulage, a heavily laden wagon on a steep incline needs a straight pull. In later days, the road followed the contour, which gave easier grades, though the curvature was not so suitable for the passage of a wagon drawn by a long span of oxen. But on that night in 1898, the Christmas Pass Road was straight, steep, and heavily scoured from recent rains. It was also the only route.

The lighter wagons climbed up first, with only one double spanning, which means that another span from one of the other wagons was added to help the one in action. The heavy wagon carrying the timber was the last to tackle the slope. The approach up the lower incline was made with a double span, to which yet another was added as the slope steepened. The wagon canted over in a pot-hole, and the timber began to

slip back. Yet another span was added, and eventually seventy-two oxen hauled the load over the last short stretch to the top.

Had every ox pulled its weight, such a number might not have been necessary; but however good the drivers were, in the darkness there were always shirkers to add to the dead weight.

After nearly five hours of toil, the last wagon reached the outspan at the top of the Pass, and there we stayed until next sundown. It was less than three miles from the outspan we had left.

It was nearly midnight, with a light moon shining, and we were all settling down for the rest of the night, when someone called out that the mail coach was coming. Here was yet another novelty to add to the experiences of the night.

The stage coach at that time ran from the railhead south of Bulawayo to Salisbury, a distance of about three hundred miles, and on from Salisbury to Umtali. It travelled by day and by night with surprising regularity and punctuality considering the distances traversed and the state of the tracks, which could hardly be called roads. This was the mail service already mentioned, organised by the famous Doel Zeederberg between South Africa and Rhodesia.

The coaches themselves were imported from America, of the type that figured in the fabulous Deadwood Dick stories of the Wild West. The last coach arrived in South Africa at the beginning of the new century. In 1906, when Doel Zeederberg was in my camp on the Kafue River in Northern Rhodesia, he mentioned that the builders in America were closing down their works, and had informed him that they would be unable to supply him any longer. But the days of coaches were finished for Zeederberg too, and so ended another phase of African travel.

It was wonderful how such apparently flimsy vehicles could stand up to such rough usage—lightly built frames, spidery wheels, and bodies slung by leather springs to the "C" springs. In addition to their eight or ten passengers, they carried a ton or more of mail and baggage in all weathers. They were drawn by a span of ten mules, and averaged at least seven miles an hour over hills and through rivers, changing

teams every ten to fifteen miles. It took two to drive. The driver sat on the right, holding the whip, which he could use with most amazing dexterity, while the leader, as he was known, was on the left holding the reins. This was the secondary position in the combined operation, but needed considerable skill too, as I learnt later when I practically lived "on trek" with a cart and mules.

On that night I marvelled that such a contraption could be kept going at all. The track was appalling, and you could hardly see the mules' ears in the dust and dark ahead.

The coach halted at the top of the Pass for a breather. The driver, an Irishman named McLaughlin, stopped to chat with us. Then, with the whip cracking, and the echoing raucous yells to individual mules which were an integral part of the performance, the coach disappeared in a cloud of dust over the brow, and down the steep incline it had taken us so many painful hours to ascend. From where we stood, looking down the slope into the deep shadows of the Pass and the valley beyond, it seemed as though some satanic carriage had disappeared into the abysmal Pit.

After a day spent at the outspan, among other tasks reloading the timber wagon which had given so much trouble in the ascent of the Pass, we inspanned at sundown, and our trek really began.

A day or two later, we passed numbers of natives from the Portuguese territories to the east, travelling the road to Salisbury in quest of employment. The mines were re-opening, and there was work again. Some of these natives were willing to be taken on as carriers, so Cyril Hoste and the Archer-Burtons decided to engage enough to take them on to Salisbury. I was left to follow with the wagons and kit, though I was far from keen on being left behind on my own. But the subsequent weeks were my apprenticeship to the life and the laws of the veld, and afterwards I was extremely grateful that I had had a chance to learn so soon.

Some years before, a young man called Percy Fitzpatrick had trekked with wagons under somewhat similar conditions through the Lowveld to the Transvaal. After his journey, he

wrote that classic of wagon travel, *Jock of the Bushveld*. It was not until many years later that I read and re-read that vivid description of life on the veld as it was in his day, but it might have been a record of my own introduction to the bush, only with slight differences in time and place.

My travels were later, and several hundred miles further to the north, but on my trek I did the same foolish things as the "tenderfoot" Fitzpatrick. I got lost in the bush. I walked in circles trying to find my way—a very easy thing to do in that sort of bush, I may add. I panicked, and fired off my gun as a signal almost within sight of the wagons. Luckily for my pride, those at the outspan thought I was simply shooting. Unfortunately I did not have Fitzpatrick's grand old American prospector to advise me. His remarks and maxims in *Jock* are the true basis for life in the open.

In a surprisingly short time, I learnt how to look after myself. A main necessity was to collect a stock of firewood on the wagon, whenever it was available. There were stretches of country where it was not, and then we had to use dried dung cakes, collected at the outspans. Even after so many years, the scent of that acrid smoke never fails to recall memories and scenes of open spaces, clear skies, and bright starlit nights on the veld.

Cooking was not my long suit, but I got down to it. Bacon and bully were easy, and I occasionally had a share of a hunter's pot belonging to one of the other wagons.

This hunter's pot is described in *Jock of the Bushveld*, and has a realm of its own. It is a stew brewed in one of the three-legged iron cooking pots of the time, on the line of the French stock-pot, where all is welcome. The basis was meat, and whatever vegetables came to hand, mostly potatoes—sweet or otherwise—pumpkin, and mealies. These could all be obtained from natives along the route. The pot was replenished with anything that fell to the gun, whether bird or buck. At the outspans, it was unhooked from the wagon, and brought to life again over a slow fire.

The art of its guardians was to prevent such a perennial mess from going sour. It was free for all, and extremely good.

Sourdough was our only form of bread, but it was not always on hand. In those competitive days the experts who could make it were often busy in the dry season looking for grazing for their cattle, and then I was dependent on my own resources.

After numerous experiments as to the quantities of flour, baking powder and water required, and important decisions regarding the time of cooking necessary in my iron pot, I managed to produce an indigestible mess called a cookie. This, when it appeared from the depths of the pot, was always a surprise packet. Sometimes the ingredients were transmuted into solid rock. At other times, the granite exterior cracked to reveal an inner consistency reminiscent of Camembert cheese. Somehow I ate these and lived. This experimental cookery was an interesting daytime occupation when one was not out in the bush shooting, or asleep near the wagons.

The actual travelling was very monotonous, when the wagons were on the move at their pace of two miles an hour. The only way to avoid the continuous thick cloud of dust enveloping the column was by travelling on foot. This meant walking either well ahead or a long way behind. To walk ahead was preferable, but to me inadvisable, as I was absorbing far too much information at the time on the subject of lions. The stories of transport riders, both coming and going on the route, centred chiefly round this topic—possibly for my benefit. From their conversation it seemed that the country was simply crawling with the beasts. On occasions when I braved the position ahead of the wagons, I sometimes heard them, and was duly impressed.

I was never sorry to reach the end of either trek, and learnt to be fairly quick off the mark when the wagons stopped, particularly at the end of the first trek at about 9.30 in the evening.

The routine seldom varied for the preparation of the light meal eaten before turning in. The fire had to be got going, and a billy of water hotted up. Into the billy went some sort of grease, possibly bacon rind saved from the day's supply, and pea flour was added to this simple stock. When the mixture

was ready, a cookie was broken up and dissolved in the liquid, as far as anything so resistant could be said to yield to persuasion. The whole mess of pottage was then ready to absorb. It was a light meal and did not take much thinking out, but it served its purpose, and did not take long to prepare. This was an important factor. I never worked out the exact "bogey" for it, but from the time the wheels of the wagon stopped turning to the time when I was rolled up in my blankets and asleep alongside them was less than twenty minutes.

Between two and three o'clock in the morning the morning trek began, and in the cold of that season of the year and at the pace of the ox, it was a dismal business.

I imagined before I left England that all Africa was hot, and had brought with me only clothes of light khaki drill. I tried to convince myself that I only fancied it was cold; but I crawled along ahead of the wagons, firmly wrapped up in my blankets, until sunrise. When we reached Marandellas, sixty miles from Salisbury at an altitude of 5,600 feet, I saw frost and ice. I was at last convinced that my imagination had not betrayed me, and that all Africa was not tropical.

All along the road we met evidences of the recent troubles—the rinderpest and the native rising. Skeletons of oxen that had died by the way still lay on the veld, slowly disintegrating. We passed the gutted ruins of burnt homesteads, and the roadside graves of families who had been foully murdered, the burial place marked only by a tree-trunk felled across the spot.

When we arrived at Salisbury, the wagons were off-loaded at their various destinations. Our things were unpacked at a hut near the present Club, rented for us by Jimmie Archer-Burton who had gone on ahead.

CHAPTER II

SALISBURY, 1898

By that time, I was completely converted to the open air life with the wagons, and did not look forward to the prospect of living under cover again. Cyril Hoste and Vivian Archer-Burton had gone north of the Zambesi to trade cattle as they had planned. James Archer-Burton had obtained a small plot of land on the Hunyani River Drift near Norton's Poort, twenty miles to the west of Salisbury, where he proposed to start his trading post. Just through the Poort and down the river lay the remains of the burnt-out farm of the Norton family, much the same as at the time of their murder by the Mashonas.

With the remainder of the party occupied, I was left to find what I could for myself in Salisbury.

Though the main Mashona rising had been crushed, rebellion still smouldered in outlying districts, and measures had to be taken to stamp it out completely. Consequently, the country had not yet entirely resumed its normal life, but as matters were settling down, those who had been prevented by the troubles from resuming their previous occupations in outlying parts, were spreading afield on their lawful occasions.

Even before this, after service in the various native wars, the restless urge for new fields had already prompted Ewart Grogan to start on his epic walk from Cape to Cairo, with its long safari through then unknown territories. He eventually reached the Sudan just after Kitchener's victory over the Mahdi at Khartoum. After this great effort, Grogan returned to East Africa and assisted in the development of Kenya, instead of returning to Rhodesia.

In the scattered township of Salisbury there were then not more than three or four hundred white men, excluding the

Mounted Police, and about thirty to forty white women, though others were fast returning. Except for the civil servants, everyone seemed to be hard up. Those who were in jobs considered themselves lucky. There was not much to do, especially in my line.

As far as work went, matters did not look too bright for me. Being hard up did not matter, as everyone else was in the same state but remained cheerful withal. To add to the numbers of those in search of jobs, the "E" troop of the Mashonaland Mounted Police had recently been disbanded after their year's service. There were a hundred of these, recruited in London out of five hundred applicants—nearly all public school and 'Varsity men, many of whom had means of their own, or were "on remittance", and all very good fellows.

Living was very expensive. There were no duties, but the only thing that seemed to be cheap was whisky at 3/6 a bottle—and real whisky too, compared with the latter-day article. Unfortunately at that time I did not drink it.

All fresh vegetables and other provisions were sold by auction on the early morning market. Once a cabbage—the only one on sale—fetched eighteen shillings. Fresh eggs, not the native variety, cost at times as much as thirty shillings a dozen. When some of us messed together, we simply could not afford such items for our menu. Board in the so-called hotels, where those who could afford it took their meals, cost from £12 to £15 a month without lodging. Even at that price the catering was indifferent. I did not aspire to such heights. I lived on about £6 a month, part of which went on the rent of the hut near the site of the present Club. Through the thatch I could see the stars at night. Sleeping on the floor was no hardship, after trekking with the wagons. Later, finances ran to the luxury of a stretcher, but it was much colder than on trek, and I could only afford a limited supply of blankets.

I still continued cooking, and either my technique was slowly improving, or else I was growing more accustomed to the curious messes I concocted. The fowl cookie had been replaced by a more satisfying form of food, easier to inspect

during its evolution, and not quite as temperamental as its predecessor.

The ingredients remained the same—flour, baking powder and water—and the right proportions were still a glorious uncertainty. The mixture was formed into a paste, sometimes fluid, sometimes not. The precious bacon fat, or any other available grease, was heated in a pan, and the paste plunged into it. The result was sometimes light, brown and bubbly, sometimes solid, thick and flabby, resembling the hide of a newly-skinned hippo, and about as appetizing. At least these bread substitutes provided food for speculation if for little else, until one rose in the world and could eat human meals again.

Eventually I joined up with one of the "E" Troop lads, and we started housekeeping together in a wattle and daub hut a short distance from my first home. The arrangements were simple. There were no beds, as my companion too had learnt to do without one, during his year's patrol with the police. Blankets on the floor were sufficient for our needs, and they could be rolled up to provide more space during the day. The kitchen was a simple structure, consisting of a sheet of old galvanised iron, which leant against the wall outside the hut. We also ran to a small native piccanin, to do chores and fetch water.

Bird and small buck shooting outside the township was free for all. Occasionally during the rains, there were duck and snipe in the vleis between the Kopje and the Causeway side of the town. We had saddles but no ponies, so competition for the better shooting grounds meant bicycling with a blanket and pot for some miles, and sleeping in the open for a night or so. This was very pleasant in the dry season, when there was not much else to do.

Our hut became a rendezvous for the ex-"E" troopers, who frequently shared our bed and board—principally bed, or rather floor space sufficient to accommodate the odd blanket. Board was very plain. There were no expensive features, but with occasional luck at shooting, and a combination of resources, we did not do too badly. As I have said, fresh foods were luxuries, and eggs were definitely beyond us. Even the

plutocrats who boarded at hotels or at the Club had to supply their own.

One day we were offered some eggs by one of these plutocrats, a man not noted for his generosity, who boarded at the Club for £15 a month. We jumped at the offer, quite unsuspecting of any catch, although we should have known better. We went into a huddle about our wonderful windfall, and decided that bacon, then scarce and very expensive, should be procured, and that eggs and bacon were to be the menus for the next morning's breakfast—bright yellow eggs, with very white whites and crinkled edges. This would mean stoking up the fire to a temperature far beyond the usual, and wood was not too plentiful.

The responsibility for the necessary arrangements was too great to be relegated to the piccanin, with so much at stake. As it was my turn to be chef that day, I undertook to handle everything, and all went according to plan until the crucial moment of the actual cooking.

I had never fried an egg before, and omitted to crack the first one into a cup before dropping it into the sizzling fat. As I struck the egg on the side of the pan, a blinding flash like summer lightning spread in an instant over the whole surface, completely enveloping our hard-won bacon. At the same time I was made aware that there was no urgent need to crouch so close, and I viewed disaster from afar.

A few mild remarks, impersonally addressed to the Universe, brought the waiting lads out at the double. We looked down in silence on our dead, and the remains of our shattered dreams.

When we informed the donor, he thought it a huge joke. We went into another huddle, and discussed reprisals. Eventually we decided on a little surprise, to take the form of a bright welcome home for him on his return from dinner at the Club. (We were not, at that time, members.) That evening, with the remaining eggs of the once-treasured batch, we proceeded at short range to plaster the entire door of his room. In perspective the effect was admirable. Even Turner in his most brilliant sunset mood might have envied it.

The laws of compensation worked for us as well. Our joker subsequently disappeared from public life behind the bars of the local gaol, for fraudulent bankruptcy.

The formation of the first Club in Salisbury raised some difficult social problems. At this time Dr. Jameson was Administrator of Mashonaland, and he took the chair at the first meeting to discuss the project. As the idea originated from members of the Civil Service, it was decided to call the club the Civil Service Club; but civil servants were not sufficient to fill the membership roll, and it was decided to admit others, such as officers of Her Majesty's Forces, professional men, and so on. Then arose dissension over the smaller fry, such as merchants and traders. The story is told that after lengthy and stormy argument, the question was put to "Dr. Jim". With the famous twinkle in his eye, he replied:

"I consider that anyone who has been out of prison for a period of three months or more, should be eligible for membership of this Club."

At the time of my arrival in Mashonaland, Mr. William Milton—later Sir William Milton—was Administrator. Mrs. Milton, who was very kind to us younger men, occasionally gave small dances at Government House. Women were scarce, so the entire female population was in request for these dances. As most of them were married, a room was provided for the babies, who could not be left at home.

Men, on the other hand, were all too plentiful. We appeared alternately from A to L, according to the number required in that category, and from M to Z. The recently disbanded troopers were not well off for civilian clothes, especially evening ones, so the dress suit that I possessed went to all the parties, though not necessarily with me inside it. Such was the cheerful communal life of those days.

On one festive occasion a race meeting was held, with a subscription dance to follow. A very attractive young woman, who was visiting Salisbury from the coast with her father, appeared at the races. Unmarried women were then as rare as rubies, so she was well attended. She said she hoped to see me later, and would keep a dance for me—those being the

days of programme dances. I did not like to tell her that I should not be present, as the suit was otherwise engaged.

When she encountered its occupant for the evening, who asked her for a dance, she inquired whether he had seen me, to which he replied that he had not. Later in the evening, she asked him again if he was certain that I was not there, as she was keeping a dance for me. By that time he was rather enamoured, and wanted the dance for himself, so to confirm this certainty he had finally to confess that he was wearing my clothes. He was a cheerful soul; his end came commanding a field battery in the 1914 war.

Another ex-"E" Troop lad, a near relation of the Speaker of the House of Commons at that time, was the wearer of this popular suit at a subsequent party at Government House. He was returning home on foot, but the way across the veld was long, and the evening had been well spent, not entirely in dancing. En route he decided that he was weary and that sleep was necessary, so removing the coat and rolling it up for a pillow, he had a little rest by the way. The Salisbury soil is red, and after a light rain, apt to be clinging. The marks were with that much-worn clothing until the end of its eventful life.

So the days went by until my first dose of malaria descended on me. It all started on one of my trips from Salisbury, when I got caught on the wrong side of a river in flood. I was stranded, soaking wet, for several days in a leaky shelter, alive with mosquitoes. This meant a spell in hospital when the fever appeared a few days after my return. The hospital at Salisbury was then under Dr. Andrew Flemming, the P.M.O. for Mashonaland, one of the most sympathetic of men, who with his wife had been in the country since the early days.

The nursing staff then consisted solely of a devoted band of Catholic Dominican Sisters, under the famous Mother Patrick, of blessed memory—one of God's grandest women, who carried her own beatification in her life of service. Written elsewhere is the story of how she came out to the country at the beginning of its settlement with her few Sisters, and how they nursed the sick and suffering when there was no hospital, and only the bare ground of the huts to lie on.

I shall always remember her sweet expression and gracious ways during that first attack of fever. She died not long after I left the hospital. By that time the Sisters had been replaced by trained nurses from England.

A tablet in commemoration of Mother Patrick's great work is now in the Protestant Cathedral in Salisbury. Her funeral, which was a full military one, and the biggest Salisbury had yet seen, was headed by the recently formed Police band. Everyone who could walk, from all sections of the community, followed the procession along Pioneer Street to the cemetery outside the town.

In those days, nobody normally wore a coat, but on that occasion everyone had done their best and acquired some sort of garment, many of them of strange fashion and rare design. There was one exception, however, who walked beside me in the procession—an old prospector known as O'Rory of the Hills, who had probably not possessed a coat for years. But he was scrupulously cleaned up, and as a serious mark of respect he wore by way of an addition to his wardrobe, which was usually a khaki shirt and trousers, a pair of spats over his well-worn boots.

O'Rory of the Hills was one of those old-timers who would be away prospecting in the bush for months by himself, during which time nothing would be heard of him. After staking a gold claim and sinking the necessary thirty-foot shaft to prove it, he would then come in to town again. If he was lucky, he would dispose of his claim to one or other of the mining companies. After buying the necessities for his next trip, the remainder of the proceeds was soon disposed of over the bars in Pioneer Street. There was a constant flow over these weirs when open. Later, when all was gone, he would not touch a drop of liquor, and would be seen trudging out into the blue, with a native carrying his small kit, to repeat the performance all over again.

There were several of these old-timers, who had taken part in the various gold rushes in different parts of the world, and who were then ranging around Mashonaland.

There did not seem to be much prospect of civil engineering

in the country at that time, nor was there likely to be in the near future, but I still kept at my studies. In the meantime, I had to do something to help the exchequer, so I took on any sort of job that offered.

During my previous training I had learnt to draw, so one of the jobs I tried was with an architect who had recently come up from South Africa. He was entering for a competition to submit plans for a public memorial building, to be erected later in Salisbury. I worked on those plans for over a month, without having made any agreement about pay. The plans did not succeed, though we got second place in the competition. It was over the month, and before the plans were sent in I suggested that something towards the funds would be acceptable. On a plea of other work being slack, he produced the sum of £7 10s. I decided that any future fortune would not be likely to come to me from that source.

Occasionally I gave a hand to the prospectors by making comparatively intelligible sketches of where they imagined their claims to be staked, marking the positions of possible Eldorados. Another part-time job which gave me some occupation and furthermore carried a small but regular return, was with an agent for a number of mining companies. Here my knowledge of plan work came in useful again.

This agent was also Deputy Sheriff, and I helped him in this capacity too. At that time his work was of more than ordinary interest. The stamping out of the Mashona rising which had broken out after the quelling of the Matabele, had reached the final phase—retribution. Those Africans known to have committed atrocities during the rebellion were being arrested and brought to Salisbury for trial.

There were no Law Courts in Salisbury then, and so the court was held in one of the lower rooms of the French South Africa buildings, a very small and stuffy room for such a purpose. The only other double-storied building in Salisbury then was a private house which afterwards became the Residency of the first High Commissioner for Mashonaland, Sir Marshall Clarke, who arrived in the country while these trials were in progress.

On several occasions when my employer was unable to attend court, I deputised for him. Although I had previously heard frightful tales of the atrocities committed during the rebellion, it was in that Court that I really learnt first-hand of the awful deaths suffered by some of those murdered white women and children, often at the hands of their own house-boys or servants.

Before this I had had little experience of the law, but what I saw then gave me great respect for its workings, and much food for thought. On occasions when it seemed to me that there was not the slightest doubt of the prisoner's guilt, and when he himself had practically confessed his crime, endless sifting of the evidence would free him from the death sentence. Such was the integrity of British justice, exemplified even in such unimpressive surroundings.

If the sentences could have been carried out immediately after the hearing of that distressing evidence, few of those present in court would not willingly have volunteered to assist in the execution of these murderers. As it was, there was no executioner available, amateurs were not anxious to try a specialist's job in cold blood, and numbers were piling up in the gaol. It looked as if the Deputy Sheriff would have to deal with it himself, as the enforcing of the sentence was part of his duty in such circumstances.

Eventually an ex-sailor from South Africa volunteered for the task, although he had had no previous experience in such a highly skilled profession. The executions were timed for 8 a.m., and were attended by the Sheriff and Father Rickardt of the Catholic Mission at Chishawasha, some twelve miles from Salisbury.

It was suggested that I should attend some of these functions as a change from my normal duties, but I felt that it would not provide much in the way of light relief. Sitting in the asphyxiating atmosphere of the Court was the limit to which I was prepared to assume the mantle of Acting Deputy Sheriff.

In accordance with procedure, each of the condemned men received his own black-edged warrant for execution, signed by

the Deputy Sheriff and delivered to the Governor of the gaol. One morning at about twelve o'clock, I rode down with a batch of warrants. The gaol was then outside the township, just above the outspan, on a road running down on the Causeway side to a drift of the Makabusi River. Two white warders were on guard over about a dozen prisoners who were working or exercising in the vegetable gardens outside the prison walls.

As I neared the scene, without warning the row started. A prisoner suddenly hit one of the warders on the head with his wrist shackle, and three others, having somehow partly freed themselves from their leg irons, began to run for it. Revolvers were fired with little effect, and the three gained the road on the way down the slope to the drift.

Two wagons were outspanned not far from the gaol. I rode after the prisoners, and as I approached these wagons a transport rider, hearing the hullabaloo, came out with a rifle. I kept clear, while he did a little dramatically accurate shooting. The prisoners were then clear away. They had managed to cast both shackles and clothing, and were running stark naked. As I watched, the first tripped and fell, and the second dropped with a bullet through his thigh. The third was well away and making good speed down the slope, by this time a pretty long shot. He turned to see what had happened to the others, and as he turned back to put on more speed, a bullet caught him in the base of the skull. He never knew what had hit him, and escaped the death by hanging meted out to his less fortunate companions. The whole affair was only a matter of seconds, but as an exhibition of marksmanship it impressed me for years.

One of the condemned Africans faced his fate in more dignified manner. Evidently a man of consequence among his own kind, he asked to see two of his people as a last request. Permission was granted, and under the supervision of a warder, the interview took place. The three sat in conclave. One of the visitors produced a short piece of red cord which was handed to the condemned, who then proceeded to make what was possibly his will. Each of his statements was repeated, a knot was then tied in the cord, and another statement made. This went on until there were numerous knots

extending almost to the end of the cord. The statements were repeated once more from start to finish, and the cord solemnly handed to the visitors, who then departed.

Nearly a year had passed since my arrival in Mashonaland. I had made a lot of good friends, and had gained valuable experience of life on the veld, and conditions in the country generally. This was all to the good; but all these odd jobs, however interesting, were not advancing me at all along the line I had hoped to follow.

The Mashonaland Railway between Umtali and Salisbury was then under construction. Much as I would have liked to be taken on, they were fully staffed. Messrs. George Pauling & Co. were the contractors for the works. Their chief, Mr. A. L. Lawley, lived in Beira. Without influence, there seemed no chance of joining them, but once more luck was on my side.

The previous year we had travelled out from England with Dr. Hayes-Lovell, medical officer for Pauling's, and his wife. These fellow passengers, who were now living in Beira, most kindly intervened on my behalf. I went down to Beira on chance in June '99. The broad-gauge railway to Salisbury had recently been completed, and the widening of the 2' gauge between Beira and Umtali was due to begin. Here was hope for the future, in my own line of work. I confided this hope to the Hayes-Lovells.

A few days after my arrival, they dined with Lawley. Next day they brought me my first commission, which was scribbled on one of the flaps of an Egyptian cigarette-box. It read:

"Varian all right, starts tomorrow morning."

So began my career with the Pioneer Railways in Africa,

CHAPTER III

EARLY RAILWAYS IN SOUTH AFRICA

THE inaccessibility of Africa has always been its outstanding feature, and the greatest drawback to its development.

Here is a vast continent, covering one fifth of the world's land area, with an enormous treasure of diamonds, gold, copper, tin and coal, with products of oil, rubber, coco-nuts and cotton, with such a wealth of tropical fruits that its inhabitants can exist with a minimum of labour. Its great central plateau runs for thousands of miles at such an altitude that white races can live and thrive in a favourable climate suited to the introduction of crops and stocks from all over the world. In spite of all these advantages, Africa has remained untraversed and unknown to the civilised world until comparatively recent times.

The only easily accessible part of the continent, the valley of the Lower Nile, provides our earliest historical record. A navigable river in a fairly temperate zone, defended on either side by deserts—these factors combined to foster the growth of a high civilisation in Egypt when, as far as we know, the rest of the world was in a state of barbarism.

South America and India resemble Africa in shape, but differ from it in contour. Where in each case they have a mountain range running north and south on the western shore alone, Africa possesses a formidable barrier all round its coastline, both west and east, varying in altitude from 3000 to 8000 feet. Rivers south of the Equator are few, and impossible to navigate in all but a few instances. Even here the navigable distance is very short, and rapids, caused by the abrupt rise of the country, prevent access by boat to the interior.

Protected then on the north by the Sahara Desert, and all round the west and east coasts to the most southern point by

mountain barriers, the interior of the continent remained untouched by the development of western civilisation.

It is possible that Central Africa was explored at some time by a foreign race, of which the Zimbabwe ruins remain as witness—but the origin of Zimbabwe is still a mystery. Old workings have been discovered over an area of more than 40,000 square miles, and many million pounds worth of gold have been extracted from these mines without our having any historic record of the fact. This proves clearly that mining must have been continued over a very lengthy period, and at a time remote in history. Such an output would have attracted considerable notice, and would certainly have upset the markets of the world had it been produced at any time in the last thousand years.

These old workings were stopped at water level, generally fifty to sixty feet below the surface of the ground. What became of that early mining race is still a matter for conjecture. Perhaps they were a small dominant people, using slave labour, who were exterminated by a sudden rising of the natives. Possibly they left because below the water level they could not work the gold.

Galton says that energy, an attribute of the higher races, is eminently transmissible by descent. A race that showed such a capacity for labour in Rhodesia must have made history had it remained there; but when gold production ceased, there could have been no other inducement for an energetic people to remain in a country without efficient means of communication.

There was no navigable river, and it would have been almost impossible to maintain a highway between Rhodesia and Sofala, the nearest port to the workings, which experiences on occasions a rainfall of ten inches in a few hours. The camel was unsuited to the type of country, therefore the only form of transport was by native carrier. The slave trade, whose horrors inspired the stirring appeals of Livingstone and Cardinal Lavigerie, was largely based on the fact that ivory from Central Africa could only be carried to the coast on human heads.

This difficulty of access effectually locked the continent of Africa away from the outside world until the comparatively recent beginning of the period of colonial expansion.

From the end of the 15th century onwards, the Portuguese, tempted by the riches of the East, sent expeditions under Bartholomew Diaz and Cavilhao, Vasco da Gama, Dom Francisco d'Almeida and others, to find and secure a route to India round the coasts of Africa. They established ports of call at Benguela, Sofala, and Moçambique, also along the East African coast to the north—but only two attempts were made to penetrate the interior. Both of these—one to Prester John's country, and the other under Baretto to the Kingdom of Monomatapa—ended in disaster.

Later, French, Dutch and English ships all used Table Bay as a half-way house on the road to India, but still no attempt was made to explore the country beyond the coast.

The Dutch, who came to the Cape in 1652 to develop it as a base for the Dutch East India Company, were slow to penetrate the interior behind the mountains known as the Hottentots Holland. But servants of the Company decided to remain in the budding colony, immigration increased from the homeland, and the line of farms gradually spread inland. With the arrival of the Huguenot settlers at the end of the 17th century, the outskirts of the civilised area reached forty miles from Cape Town into the Drakenstein valley, where land was granted to the newcomers.

Slowly the farms encroached on the wilderness. In 1806 the English, who were carefully securing all the spots marked by Napoleon as the vital strategic points of the world, purchased the Cape Colony from the Dutch. This gave great impetus to settlement, and little outposts sprang up all along the coast from Cape Town to Natal. Still, however, there was no penetration beyond the mountain barrier, until in 1836 the few irreconcilable Boers broke away from foreign government, and trekked to the Orange River Colony and the Transvaal by ox-wagon, their only means of transport.

Communications had now become an urgent problem, and

it was imperative to find a solution if the resources of the colony were to be properly utilised.

George Thompson, in his book called *Travels and Adventures in South Africa*, discusses the possible means of communication whereby an export trade could be developed, and states that in South Africa "canals and railways are entirely out of the question." His book was published in 1827, only two years after the opening of the Stockton and Darlington Railway, the first ever opened to traffic.

At that time, this opinion of Thompson's was reasonable enough. The small locomotive of the period gave little promise of being able to haul trains of merchandise over the great mountain ranges encompassing the hinterland.

In 1860, the first railway in Southern and Central Africa was opened for traffic between the Point and Durban, a distance of two miles. It was not until 1857 that an Act was passed for the construction of fifty-four miles of railway from Cape Town to Wellington, via Stellenbosch. A contract was made by Sir George Grey, Governor of Cape Colony, with the Cape Town Railway and Dock Company, in December 1858, to construct this line under a six per cent guarantee from the Government, for whom Sir John Hackshaw was the referee. Sir Charles Fox was the consulting engineer of the Company, William George Brounger the engineer of the Company in South Africa, and Edward Pickering was the contractor.

The gauge was 4' 8½", the weight of the rails 70 lbs. per lineal yard, and the cost about £400,000. A branch line, from Salt River to Wynberg, was also constructed by this company, which was finally wound up after the purchase of these railways by the Government of Cape Colony in 1873, the year after the colony was granted responsible government.

In 1869, the diamond-fields were discovered 650 miles inland from Cape Town, and in 1870 there was a rush to the Vaal River and to Kimberley. There was evidently no conception on the part of the Cape Government of the enormous industry that would result from this discovery. After the purchase of the Cape Town and Wellington Railway, which

was the same gauge as the English railways, they converted it into a 3' 6" gauge, and this has unhappily remained until now the main line gauge all over the Union of South Africa.

This has been a great handicap in the trade and development of a country of great distances, as the speed on a 3' 6" gauge is only half of what it is on a 4' 8½" gauge. All efforts to change this to the standard gauge of Europe have been ineffectual. It was pointed out that the extra cost of 4' 8½" as against 3' 6", as shown by alternative tenders, was very small; but it was still persisted in, and will possibly now remain the standard gauge in South and Central Africa for all time.

In 1874 a line was begun to the north from Port Elizabeth, another from East London in 1876, and another from Durban in 1878. The Cape Town-Kimberley line was extended section by section, and reached Beaufort West, in the Karoo country, in 1880. There had always been a certain amount of jealousy and competition between the ports of Cape Town and Port Elizabeth, so it was not surprising to find that the railways from these towns towards Kimberley, which met at De Aar Junction 500 miles from Cape Town, were opened on the same day—31st March, 1884. On 28th November, 1885, the railway was opened as far as Kimberley.

To most people at that time, the north was merely the happy hunting ground of adventurous sportsmen in search of game. Cecil Rhodes, however, made it his creed never to despise any great stretch of country, and steadily watched the northern territories beyond the Boer Republics of the Orange River Colony and Transvaal. But for his far-sighted vigilance, our leading statesmen would gladly have consented to give away the whole interior, reckless of the danger of the consequent inevitable link-up between German South-West Africa and German East Africa.

After 1885 there was a short lull in railway construction. Kimberley was for the time the limit of the civilised world in South Africa, but the discovery of gold in Johannesburg made the Transvaal a centre of interest further inland, and as the value and prosperity of the gold industry steadily increased,

a new factor was introduced into South African politics and policy.

The four chief ports, Cape Town, Port Elizabeth, East London and Durban, all wished to compete for this new centre of trade. President Kruger, however, who saw what a tremendous difference the gold industry would make to the financial and political importance of the Transvaal Republic, and who was suspicious of the advance from Cape Colony, declared that he would have no railway until the line from Delagoa Bay (Lourenço Marques) to Pretoria, a distance of 350 miles, was completed. Until he had this independent outlet through Portuguese East Africa, he wished to isolate his country completely from the dangerous south.

Rhodes, writing in the *Cape Argus* in 1887, said:

“I feel that the present is the opportunity that may not recur; the Free State is in humour to join hands with us to mark its resentment at the policy of isolation pursued by the Transvaal, and if the right steps are taken promptly the Delagoa Bay Extension Railway, which would send all the Witwatersrand traffic through Lourenço Marques, will not be made for years. It is emphatically a case of the first in the field; if we are first and make good our grip we shall not be soon or easily disposed of.”

Unfortunately the opportunity was never grasped.

In this year, Piet Grobelaar was sent north by Kruger to try and come to terms with Lobengula, the chief of the Matabele. Rhodes urged the High Commissioner to stop this flagrant breach of the Convention of 1884, on which the independence of the Republics rested, and to proclaim a formal protectorate over all the country to the north. This the High Commissioner refused to do, but he did agree to send Mr. Moffat up to Lobengula. The latter signed a treaty with him, undertaking not to make any concession of any part of his country to any foreign state or power without the previous knowledge or sanction of Her Majesty's High Commissioner in South Africa.

In the following year Lobengula signed a further concession which, with the amalgamation of certain other interests, was the basis of the British South Africa Company, incorporated by Royal Charter in October, 1889. It was a clause in the Charter that railways would be made in connection with the new territory, and in the same month of October, 1889, an agreement was signed by the Cape Government, and by Rhodes on behalf of the Company, by which the Cape undertook to construct the railway from Kimberley to Vryburg. This agreement was used by the Government of the Cape as a lever with the Orange Free State, to allow the extension of the Cape Railways into their country. In December, 1890, the line from Kimberley to Vryburg and the line from Naauwpoort to Bloemfontein were both opened up for traffic. The anxiety of the Cape to reach Johannesburg by rail led to an agreement in 1891 with Kruger. By this agreement, the President in consideration of money to be furnished by Cape Colony towards the extension of the Delagoa Bay line as far as Pretoria, consented to the Cape Colony extending its line in turn from Bloemfontein to Germiston in the middle of the Rand goldfields. The latter line was opened in September, 1892.

Natal had still to cart goods for Johannesburg by ox-wagon from Charlestown, and was not connected with Germiston by rail until 1895. The struggle between the ports of the Cape Colony, Natal and Delagoa Bay for the Johannesburg traffic continued from then until the provinces of South Africa became a Union in 1910.

On the route to the north, the line from Vryburg to Mafeking was opened in 1892. In the same year, a line was begun from the port of Beira in Portuguese East Africa towards Rhodesia, where the settlers were in urgent need of better communication than that afforded by the ox-wagon. The Administration was receiving messages that people were starving—partly, it must be admitted, because they were not inclined to eat native food when the English food to which they were accustomed was not obtainable. Without a railway it took three weeks to travel even the 300 miles between

Bulawayo and Salisbury; the construction of a line from Beira was imperative.

The story of the construction of this line gives a good idea of the inaccessibility of the country at that time. Money was very scarce, and in order to get the line as far as possible, it was necessary to utilise such stretches of the River Pungwe as were navigable between Beira and a point on the river known as Fontesvilla, some fifty miles by water, but by land only thirty-five miles. The river section was worked by tugs and lighters to Fontesvilla, now Ponte de Pungwe, which was then the base of the 2' gauge line to the interior. The first concession was for seventy miles from Fontesvilla, sufficient to bridge the tsetse fly belt and arrive at Chimoio; from there, transport was continued by ox-wagon to Salisbury, a distance of about 270 miles. The first ten miles were submerged for a month or more on the Pungwe River flats, when the river was in flood during February and March. The jungle beyond was very dense, and mosquitoes very bad. The value of quinine was not yet known, and sickness carried off half the staff; those on the works were desperately thin and yellow.

After Chimoio, the construction of the line was continued to the eastern border of Mashonaland, now Rhodesia, and completed in February, 1898. At the same time it was found necessary to connect Fontesvilla with the port of Beira by land, and this section, constructed by the Beira Junction Railway Company, was completed in October, 1896.

No time was lost in pushing further inland from Umtali. The Umtali section was completed by the Mashonaland Railway Company on the 3' 6" gauge, reaching Salisbury in May, 1899. The difficulties of transshipment and the delay experienced on the narrow gauge from Beira to Umtali, and the limited tonnage the line could carry, emphasised the necessity of converting this section to the 3' 6" standard gauge. This conversion was carried out by the Beira Railway Company, and completed on the 1st August, 1900. Rhodesia now had an important alternative means of access to the sea.

CHAPTER IV

THE BEIRA RAILWAY

AFTER the railway reached Salisbury in May 1899, all energies were devoted to preparations for the widening of the Beira Railway to the standard gauge of 3' 6".

The original 2' gauge between Beira and Umtali, a distance of 220 miles, had been pushed through at the lowest possible capital cost, and followed the line of least resistance. The earthworks were as light as possible, while practically all the waterways and bridges were of a temporary nature. Before reconstruction was begun, considerable deviations in the original alignment were necessary. This shortened the length of the line to 204 miles, but at the cost of heavier works.

The engineer in charge of these deviations was a Scotsman named James Frame, who had been in charge of the final location surveys of the Mashonaland Railway to Salisbury. These surveys were carried out during the native rebellion, under the protection of an armed guard, so it will be realised that Frame was a pretty tough customer.

One of the first assignments of my new life was as his assistant. When I received the appointment I was told by colleagues anxious no doubt to cheer me on, that he had already killed several underlings, and that he was now eagerly awaiting another victim as his most recent one was in hospital. It was true that my predecessor was receiving medical treatment, but I did not have time to find out for what reason, as I had to take over the job immediately.

Frame made a determined attempt to kill me as well, but somehow I survived, and have been thankful to him ever since. From being bone idle, I learnt to know what really constituted a day's work. He was one of those hard, capable men whose only idea in life was work; food, recreation, even the simplest comforts, just did not matter. There was only

one tent for us to share. Here we slept and did all our plan work. The commissariat, which he had arranged, consisted principally of sardines and rice, occasionally varied by a buck which I shot by the way. It was good game country, and as such there were plenty of lions as well; but shooting meant delay, and there was no rifle in camp until I eventually borrowed one.

We followed the same routine daily. At dawn we left camp and made for the end of the previous day's work, sometimes three or four miles away. Not a word was spoken the whole way out or back, unless it was a brief sentence concerning the work itself. In that hot country, rain did not matter. We were lightly clad, and made no attempt to keep dry. Apart from getting drenched in the long grass, we had to traverse waist-deep swamps, and it was just as well to get completely soaked right away and cease worrying about it.

In the lower-lying parts of that country, I encountered an apparently innocent but extremely unpleasant plant called the buffalo bean. Happily this was not very common, and was only active for part of the year. It had a small brown velvety pod, which for all its innocuous look was really deep sin. It had only to be touched, and the thousands of minute spines composing the velvety surface seemed to creep all over you at once. The effect when they really got a hold was maddening. Grease would alleviate the irritation to a certain extent, but failing that there was nothing left but to tear off all clothing and plunge into the nearest stretch of water, crocodiles or not. If the spines got into woollen garments such as socks, the only thing to do was to scrap them.

After a time, although I did my best to conceal it, being continually wet had its effect on me and brought out my malaria again. I eventually collapsed out on the work, and then lay for several days on my bed in the tent, where blankets and everything else seemed to share the general dampness. No sympathy was given or expected. Instead of being able to pull my weight, I had become a drag on the work, which was urgent. My diet was principally quinine—not the easy modern tablet, which sometimes even has a sweetened coat-

ing, but great wads of crude flaky stuff, looking like Lux, twisted up in tissue paper or whatever substitute was handy.

I can well remember the look on Frame's face when he came into the tent from the work, and found me still in bed. He was really a sympathetic man, but inarticulate. Without a word he would hand me another wad of quinine. I do not like to think how much I must have absorbed in those days, but I felt shaken with the poison of it for months to come.

After my first bouts of fever in Mashonaland, although not much was known of the causes of malaria at the time, and the mosquito theory was only just being explored, I took quinine as a preventative every day. Subsequently, when I went down with a really bad attack, it was quite ineffective as a treatment. I then vowed that I would never take it again regularly, or indeed at all, except as a last resort, and I stuck to this resolution for the next fifty years.

We eventually got back to Beira, where I was laid up again. Whereas in previous attacks I was afraid I was going to die, I now began to fear that I might not. This fear was justified, and I survived, despite the gloomy prognostications of my friends. In addition, I had gained priceless experience, and not only in technical matters.

I subsequently learned that Frame had told Lawley I had not got a lazy bone in my body. This was praise indeed from such a man, and compensated for everything.

The job of widening the main line was then in full progress. Staff and labour were of many different nationalities and degrees. The work of distributing the heavier material was under the supervision of Major Sewell, late 60th Rifles, and the actual work of laying under Charles Buchan.

Starting at Umtali from the junction of Mashonaland, they worked back in sections, getting as much traffic as possible forward to the line already re-laid, then closing the following section where the new materials were laid out alongside, ready for use as soon as the lighter gauge was torn up.

At this stage the reconstruction and widening had been completed down as far as Bamboo Creek, (afterwards called Vila Machado), 60 miles from Beira. Here the flat coastal

plain gives way to the rising country that mounts to the Central African Plateau. With the continual shortening of the 2' gauge, the rolling stock and engine power of the original 220 miles of line to Umtali was now concentrated in this 60-mile section, where, with the exception of the approach to the 23-Mile-Creek, there were no heavy grades whatsoever. The 300 miles of completed 3' 6" gauge to Salisbury had practically the same rolling stock and engines as the original 170 miles of the Mashonaland line, and the supply of material could not be kept up to serve the rapid extension.

The work had been in progress before the outbreak of the South African War, late in 1899. At first we were not affected. The siege of Mafeking, however, by cutting the main line south of Bulawayo, diverted all traffic, both passenger and goods, through Beira; so all Rhodesia and the country south of Bulawayo were then dependent on our port and railway. This added an extra burden of traffic, all of which had to be transhipped from the narrow to the broad gauge at the junction.

In these circumstances, and when the junction was at Bamboo Creek where all the re-laying gangs were standing idle, the first contingent of Australians, New Zealanders, a battery of Canadian artillery and other mounted troops arrived without any warning, diverted to Beira for the relief of Mafeking through Rhodesia.

The total number of troops was about 7,000, mounted men and transport. Besides stores, equipment and forage, there were several thousand horses from Hungary and the Argentine, and mules from Texas and the Argentine as well. There was no provision either for camps for the men, or fencing for the animals. The rains were still on, and it was the worst time of year for malaria in that hot, steamy country. The plain of black cotton-soil between Beira and the rising ground four miles away was a swamp of standing water. That was the only place where there was space for the men and animals as they were landed from their transports.

A forward base, as the starting point for the trek south, was being formed at Marandellas, 60 miles from Salisbury

and 315 miles from Beira. Transports continued to arrive while others were still waiting to be off-loaded, as this had all to be done by lighter. There was a growing concentration on the shore, awaiting transport up-country on the already over-taxed railway.

Although there was plenty of rolling stock on the 60 miles of the narrow gauge, there was further congestion at the junction, what with the laborious process of transhipment and the shortage of rolling stock beyond, of which the motive power then consisted of three larger engines and one saddle tank shunting engine, the *Jack Tar*, which also took a hand in the long haul over heavy grades to Marandellas.

At first, before it was possible to fence in the large areas necessary to accommodate all the animals, they were let loose on the flats, with Australians guarding them and rounding them up day and night to prevent the frequent stampedes, or rather, to try and localise them. Flies, mosquitoes, and other insects were very bad, which added to their troubles. One wet night a troop of lions came in from the neighbouring bush country on the far side of the flats, and there was a really bad stampede. Although a number of animals were rounded up, many got well away and took to the bush. Some were seen running with herds of zebra a long time after, many miles away. Horse sickness and other disease which was rife in that country, particularly at that time of year, accounted for hundreds both at Beira and at the Bamboo Creek camps.

That first contingent of Australians and others were a grand lot of men, and they had a tough time. They never complained, and their only anxiety was to get to the front before the show was over. They certainly had their wish fulfilled, as this was only early in the first year of the three-year conflict. They all seemed to be well off, and were very open-handed. Beira in those days was a very small town, and of course not a British possession. To begin with, they took charge in a light-hearted way, cracking their stockwhips at the local police, who retaliated rather more seriously by shooting, so the town had to be put out of bounds.

When a number of the Australians had gone forward, a

Canadian battery of field artillery arrived. As they were the only guns with the contingent, they had a precedence above everything else, and were sent on at once. I was sent up with them to give any necessary assistance in transferring the guns, horses and ammunition from one gauge to the other. They did most of the work of transferring guns and horses themselves, while I gathered all the labour I could to deal with the ammunition, and they got away in a few hours.

Dunraven's Yeomanry arrived from England after the camps had been established at 23-Mile-Creek and Bamboo Creek. Malaria and dysentery were very bad, and a number of them died at the 23-Mile-Creek camp. During all this time, work continued day and night in the open on the erection of engines and rolling stock for the 3' 6" gauge at Bamboo Creek. Troops, animals, stores and ammunition were being got forward as soon as possible, assisted by the gangs who were still idle, waiting to re-lay the last section of the widening to Beira.

During this lull in the reconstruction, I was in Beira, dealing with what little there was to do, and assisting in the general work. Colonel Beal, who had gained distinction in the various native wars, was then in the administration of Paulings. He had recently been appointed to the Rhodesian Column then being formed under General Carrington, who had recently passed through Beira with his staff to take command. Beal offered to take me with him, as, like everyone else at that time, I was keen to get to the front. When I asked Lawley's permission, he refused to let me go, much to my disappointment, but he gave me a rise in pay, telling me to stay where I was as there was plenty of work to do. This was really a blessing in disguise, as otherwise it would have meant a complete break with the career on which I was now successfully launched, and later I should undoubtedly have had to join the unemployed. It was a slight consolation to learn that the column I had hoped to join was too late for the actual relief of Mafeking, and spent some dreary length of time on the lines of communication.

At about that time, Cecil Rhodes arrived at Beira in a

special Clan Line boat, with Sir Charles Metcalfe and others. He had brought with him a lot of pedigree stock, cattle, pigs, etcetera, for his farm at Inyanga in Eastern Mashonaland, and for the benefit of stock in general in Rhodesia. This was to be his last trip to Rhodesia, and even then he was in failing health. Both he and Sir Charles stayed with Lawley, who was an old friend of his from past days in South Africa. All three of them were much the same in size, walk and general appearance, and from behind it was not easy to tell one from the other.

Rhodes was some days in Beira before he went up-country. In the interval the pedigree stock was sent forward, but not all of it reached its destination. One pedigree sow with a litter of eight youngsters strayed over to the Australians' camp while waiting to be loaded on to the train. She returned without her litter, and travelled up alone, leaving behind in the camp what must have been some very expensive and succulent pork.

One day, Sir Charles, who was consulting engineer for the railway, was in the construction office discussing a technical item he had asked me to handle, when Lawley and Cecil Rhodes came into the office, where they were to call for him. We continued the discussion while the others stood by, and I could feel Rhodes's keen grey eyes upon me. After asking me several questions, all three left, and as they went out I heard Rhodes say in his high, thin voice:

"Who is that young man? I like his face."

I think this was one of the best compliments I have ever had.

I saw Cecil Rhodes once again, in Umtali. It was at the office of the Chief Resident Engineer of the Beira and Mashonaland Railways, Mr. A. M. Moore, whose staff I had recently joined. The office was a two-roomed shack up the slope at the back of the station. He had been talking to Mr. Moore, and was sitting on the floor of the veranda with his feet on the short flight of steps leading up to it. He was leaning forward, looking out with his head in his hands in the brooding manner which was his characteristic attitude. A troop train

of Australians on their way to Marandellas was standing in the station, and the troops were walking about in the station yard during the wait. When they heard that the great man was there, they stood about in groups at a respectful distance, and kept glancing his way. The force of his personality was legendary, and was felt even in the most casual contacts.

His travelling wagon and mules were outspanned near the office, in charge of his famous servant Toni. My chief asked me to tell Toni to inspan, and then we saw him off on what was to be his last trip to his farm at Inyanga, 60 miles to the north of Umtali.

During all this time, troops, animals and stores were being sent forward, and dumps of ammunition formed ahead. Then at last we who had been practically idle for so long, had our turn, and were warned to stand by. Lawley wired to General Carrington that he had decided to complete the widening of the last section, but with the troops and stores forward and being transported on the broad gauge, there would be no delay, and as far as Headquarters were concerned, they would not realise that the change was being made.

The remaining sixty miles was divided into sections of twenty miles each. The first section included the Beira station yard and twenty miles of main line, the second was from Mile 20 to Mile 40 and included the Fontesvilla bridge over the Pungwe River, nearly a quarter of a mile long, and the third ran from Mile 40 to its terminus at Bamboo Creek. I was assistant on the second section, and our camp was at Fontesvilla, at Mile 35.

The last narrow gauge train left Beira on Thursday morning, arriving at Fontesvilla at 11.30 a.m. The light track was uncoupled where it left the bridge some two hundred yards away, and torn up behind the train before it left the station. With such light material, it was possible with the large gangs employed to turn it over bodily, clear of the formation on which the heavier material was waiting to be laid.

It was full moon at the time, which enabled the work to continue until ten o'clock that night, when everyone slept as they were, alongside the track, to resume work again at

4 a.m. In the five miles between Fontesvilla and Mile 40 there were a number of bridges which had to be re-timbered. This caused some delay, and that end of the section was not completed until midday on Saturday.

The smaller gangs which had been working back from Fontesvilla bridge towards the end of their section at Mile 20 completed their task of fifteen miles on Saturday night. They were hampered somewhat by heavy veld fires which had been raging on either side of the line. The grass and reeds in that swampy area belched dense smoke which was unbearable at times. All hands slept out where they were in the open for a few hours, notwithstanding clouds of mosquitoes, and continued work again by moonlight.

On Sunday morning the Beira section linked up with the second one at Mile 20, providing a continuous through line from Beira to Mile 40, on which there was rolling stock of the new gauge. There had been some delay on the last section, so what labour could be spared was sent forward from the second section to continue work beyond Mile 40. On Sunday morning I walked forward from these gangs, and met Mr. Lawley walking down from the last section. I reported to him that the line was completed through to the point where my men were working, and it only remained for the two gangs to meet. By that time they were in sight of each other along the long, straight line. It began to look as if the job would run into another day, but a final spurt brought the two ends in contact just after sundown, when the junction rails were cut, and the completed line was linked up near Mile 42. As the first train passed over the completed line, it was too dark to distinguish faces in the crowds alongside. Hundreds of natives who had been working day and night towards this great achievement, tired as they were, still had the energy to dance and yell in wild excitement.

The first train consisted of an open truck propelled by the famous little tank shunting engine *Jack Tar*, and behind it one of the only passenger carriages on the line at that time. In the carriage were masses of food and drink and we, who had eaten next to nothing in the last few days, went for it all

out. Apart from eating, we had had very little chance of washing, so our appearance left much to be desired. When the first bout was over, and we were filled to repletion, the train started on the through trip to Beira.

The only passengers were Lawley, another, and myself, and we stood in the front of the open truck. The new track was simply resting on the light ballast of the previous one, and the weight of the truck sank the track as it went along, a weird sensation. We stopped at the many camps on the way, and went through the same ritual of meat and drink, principally the latter. By the time Beira was reached it was late in the evening, and things were very merry indeed.

The new arc lights erected for the night work of trooping were shining full power, transports in the bay were firing rockets, and some thousand natives employed on the work were dancing and yelling. To intensify the din, someone had conceived the idea of firing half sticks of dynamite in empty bully beef tins, a most effective form of creating noise. This type of cheerfulness was repeated in a greater degree later on, when the news was received of the relief of Mafeking. There were more drinks at the station, and then at the club, and finally a big supper at Lawley's house. This was my last recollection before, exhausted as I was, I passed into oblivion—so much so that I very nearly missed the photograph taken next morning of the arrival of the first train at Beira, re-enacted in daylight for posterity.

Soon after this I, like several others who had participated in that rather intensive work, went down again with malaria. I collapsed while supervising the re-laying of the station yard, and was taken off to my quarters in one of the small trollies which were then the only means of transport on the sandy streets of Beira.

For the next week or so, I did not take much interest in anything. I felt the effects of that last attack of fever for months, and got into the habit of waiting for the next attack, which, however, never came again, for some reason or other. That was the last real go of malaria I ever had. As I hated the buzzing of mosquitoes around me, I always slept under a

net wherever I was, much to the amusement of others. Whether it was the protection of the net, or whether I had just learned to look after myself, the fact remains that I have not had malaria again in the half century since, although, as one of my chiefs said of me, I was always sent to the places of worst possible repute.

I have often been asked how I remained immune. There is no such thing as immunity from malaria, except by avoiding mosquitoes, and the dangerous ones only work at night, and work silently. I thought the net was the only answer, whether the season was wet or dry, and I used it even when others thought it unnecessary. The mosquito theories of Ross and Manson had not then reached us, so I forestalled them unconsciously.

CHAPTER V

THE BEIRA AND MASHONALAND RAILWAYS

MESSRS. PAULINGS the contractors, besides handling the reconstruction of the Beira Railway, were the lessees for traffic and control. The widening was completed on 1st August, 1900, and after this the transport of troops and stores, which had been intensive until the relief of Mafeking, began to slacken. At the same time, the lease of the line was due to expire. Regarding reconstruction, there were still a number of bridges and waterways of a purely temporary nature, while others needed enlargement.

With the handing over of the Beira line by the contractors to the open lines for working, both this and the Mashonaland Railway came under one management. The combined lines were then known as the Beira and Mashonaland Railways, and the new management had its own staff. It looked as if the few left on the construction staff of the contractors were going to be out of work, myself among them. I had then had nearly a year's hard work, of wide range and great interest. Apart from the valuable experience gained, I had enjoyed the work immensely, and did not look forward to another spell of idleness, such as my first year in Mashonaland.

The engineering staff of the Beira and Mashonaland Railways was then fully organised under Mr. A. M. Moore, M.I.C.E., who was Chief Resident Engineer and representative of the railway company as well as the representative for Sir Douglas Fox and Partners, and Sir Charles Metcalfe, Bt., the consulting engineers in London. I made an application, which was well supported, for a permanent position on their staff, but was told there was no room for me at that time in a permanent capacity. However, I was offered work of a temporary nature, to cover an estimated period of about three months. I immediately accepted. I could see that apart from

the temporary work, there was much still to be done in the building of permanent bridges and structures, besides the completion of the line in general. As there was constant sickness and fever among the supervision staff, I felt that a chance of a more permanent post was bound to crop up, if I could stay on my feet and be prepared to carry responsibility. I was determined that if I could only get a foothold, nothing would dislodge me, like a monkey hanging on to a stick with all four paws. You can prise two or three of them off, but there is always a fourth hanging on somewhere or other.

The original concession of the Beira Railway from the Companhia do Moçambique included the concession of alternate blocks of land, five kilometres (approximately three miles) square on either side of the line. Several suggestions had already been made as to the laying out of these blocks, but so far nothing definite had been decided. Now with the railway completed the opening up of the country became a more immediate prospect, and it was imperative that a scheme acceptable to both the company and the Government be drawn up before settlers were permitted. The work I had been offered was the drawing up of this scheme.

For the first sixty miles across the coastal plains to Bamboo Creek, the line was practically straight and presented no difficulty. After that the steep gradients began, and the line became very tortuous. It was impossible to mark off blocks every five kilometres, square with the line, which would contain the necessary 2,500 hectares, but would not overlap the adjacent blocks belonging to the Government.

So many deviations had been made for the shortening of the original 2' gauge, that there was now no consecutive plan of the line available, and what details there were had to be collected and pieced together. Parts that were lost or mislaid had to be re-surveyed. Eventually the jigsaw puzzle became comprehensible; the work took less than the stipulated time, and the scheme was accepted by the Portuguese authorities as presented, to form the basis of the negotiations that followed.

After reducing the plans to some sort of order, the most

urgent task was to check the whole line and to mark off the five-kilometre sections. This meant walking the whole length of the 200 miles. I therefore set out with a railway trolley and half a dozen natives to measure these points, walking all day, and making a wayside station or a ganger's hut for the night. The order of procession was as follows: first, a native armed with a red flag several hundred yards ahead of the measuring party (at least in theory); then the trolley; then another red flag several hundred yards behind.

The job was pretty monotonous over such a distance, and was certainly not one to waste time on. The first day, a very hot one, I made Dondo, over eighteen miles of white sand. Dondo itself was situated in a belt of thick forest. It is now the junction of the Trans-Zambesi line north to Nyasaland. This was the first siding after Beira to possess a telegraph and white telegraphist. The telegraphist had been warned to expect me, and to provide sleeping space for me in the two-roomed shack that served as a station.

The little siding was the setting for my first meeting with O'Flaherty, who was destined to link up with me again later. O'Flaherty was one of those extremely able men possessing the one apparent failing. There were a lot of his type on those works at that time, and a great deal depended on them in such extremely unhealthy country, where replacements were so difficult to get. They would do two men's work under the most trying conditions for several months in total abstinence, and then the inevitable craving would overcome them, followed by the break which was succeeded by another period of calm. By making allowances for the cycle, one could get a lot of work done.

O'Flaherty was of course an Irishman, with all the national brogue and wit. He had been a sergeant in a Hussar regiment stationed in India, and always, except during his lapses, was extremely smart, with a fiercely-waxed moustache. He was on works under me later, and one of the best men I had. I learnt to know that moustache like a barometer. When it showed any sign of losing its smartness, the break was not far ahead. This gave me time to prepare for it, like a cyclone

warning. He had been through an engineering course at the Rhoorkee College in India, and eventually came to Africa from there with the first survey party for the Uganda Railway. In his spare time he occupied himself by editing a paper which he called the *Dondo Blazer*, with the most amusing letterpress and illustrations by himself, which he printed with the old-fashioned gelatine copying process. It was a two-page sheet, and he distributed it down the line free of charge.

Towards sundown I arrived, feeling that I had had enough for the first day through the hot sand. On nearing Dondo I had noticed a lot of fresh lion spoor along the track, and when O'Flaherty came out to meet me, I remarked on it. Then I saw that there was a rough ladder made of bamboo leaning against the station shack, by which, as I discovered afterwards, he could retire to the roof on occasions.

In a rich brogue he told me that he had been having a lot of trouble with lions recently, and asked me to help him that night, when he reckoned to deal with them. He had a friend with him, invited for the purpose, but unfortunately he was down with fever. I never saw the friend, but could guess at the nature of his complaint, and realised that my host was well on the way to developing a similar fever himself. Did I have a rifle? I had. And would I sit up for the lion as it was a moonlight night and they came round early and he had a goat for the occasion? I would.

The station shack was raised a foot above the ground, with an open veranda six feet wide in front. Beyond, between the veranda and the siding about ten yards away, was a small wooden fence of light sticks, two feet high. I shared a room with the telegraph instrument, while the sleeping quarters next door were occupied by O'Flaherty and the friend with fever. SnORES issued from this neighbouring apartment, followed by occasional liquid, gurgling sounds, then snORES again.

By the time I had had some food, it was dark except for the moon. The goat was duly tethered to the entrance gap in the fence, and I duly took up a seat on the veranda and began my vigil. There were lions about all right. I could

hear them moving about in the bush beyond, but even the tension this roused could not compete with my fatigue, and eventually I dozed off. O'Flaherty had started the watch with me, but the claims of his sick friend had become irresistible, and he had gone off to join him. Deprived of his presence, I sank into welcome slumber.

Agonised bleating from the goat brought me to with a start. O'Flaherty was on the veranda again, the fever strong on him too by this time. There was no sign of a lion, and I asked why the goat was making such an appalling noise.

"Have I not a piece of string tied to him to keep him awake? The lions will not be through here, if not."

I gathered that the string was attached to one of the more tender spots in a goat's anatomy, and I was duly instructed in the use of this little device, but had not the heart to carry out my instructions.

My host disappeared once more to join his friend, and very shortly their united snores floated out on to the veranda. I continued my vigil for a time, still hoping, but lack of incident and the day's exertions had their effect, and I must have sunk into oblivion again. When I woke, more than an hour had passed, and all was quiet. The goat had gone, string and all. Only the lion spoor remained to tell the tale of his disappearance. Poor little victim, he must have slept as well, and his end must have been sudden and silent, or else I should have woken. There was still lion work to do, but it would have meant another goat. I decided I had as far as possible honoured the obligations imposed on me by O'Flaherty's hospitality, and turned in. I left at dawn next morning, the duet of the fever-stricken pair ringing full blast in my ears.

Some time after that episode, O'Flaherty left the railway. I next heard of him as a warder in the Umtali gaol. Never were prisoners so smart. He had them drilled, and marched them in proper military formation, with shouldered picks and shovels. At that time the stream that runs by Umtali was being cleared to form a park, and the work was being done with prison labour. While engaged on this, the inevitable fall from grace occurred, after several months of unblemished

record. It was time to return to gaol at the end of the day's work, but there was no guard. The two European prisoners in the party fell the natives in, and marched smartly back to prison, carrying their warder with them. A little later, O'Flaherty was out of work.

Roxburghe, the parson at Umtali, whom we all liked and respected, asked me if I could do anything for him. Luckily I was able to help, as I was collecting men for a very unhealthy work on the Coast. He was one who came, and never let me down. He had his breaks, but I allowed for those—and so more of him later.

There was another incident, towards the end of the trip, that was not so amusing.

The usual daily procession was on the march along the line—myself and the trolley gang preceded by the flag boy, who was supposed to be the regulation few hundred yards ahead. In addition to this precaution, all traffic was warned to look out for us at an approximate daily position. The scheduled traffic I knew, and had the line clear well ahead of them. So far this had been successful.

One day we encountered a light engine at one of the worst possible places on the line—a deep cutting on a sharp corner, where visibility was only a few yards. The flag boy, who should have been a quarter of a mile ahead, thought he would rest for a little at the far end of the cutting. The engine, though proceeding cautiously, saw no flag, and carried on towards the entrance of the cutting, just as we emerged. Luckily we met outside, where the hillside fell away in a steep bank. We leaped, and rolled down the bank. The engine, in a cloud of steam, with all brakes applied, and looking as high as heaven from our viewpoint down below, struck the trolley smartly, reducing it at once to matchwood and old iron.

Our escape was a miracle, and miraculously the “chop box” escaped with us. It remained intact, but its contents, like ourselves, were badly shaken. There are no known data as to the correct proportion of eggs and fruit-salts required to form a quick-setting cement, but what the box contained when

opened seemed to be as near perfection as possible. Could we but have turned it out of its casing, we should have achieved a solid cube of a brilliant yellow, containing tins of all shapes and sizes, and sundry other oddments, embedded in it like flies in amber.

While I was busy drawing up the scheme for these five-kilometre blocks, more work of a general nature seemed to crop up every day. There was a great deal of sickness and malaria among the staff, and I found myself not only taking over other people's work, but also occupying a more permanent position as more and more casualties dropped out.

On the main line, the construction of permanent bridges and works continued. After one very bad accident on the Mashonaland line, when a timber trestle was burnt out either by a veld fire, or by sparks from a wood-burning engine, and a whole train and its crew were plunged into space to be completely destroyed, orders came from England that the work of replacing all timber bridges was to be speeded up.

There were many wash-outs, as original openings and culverts had in many cases been under-estimated. Numbers of earthenware culvert pipes, quite unsuitable for the class of work but the only things obtainable during the original construction, failed under the pressure of the high banks above them. This entailed tunnelling through the banks, removing the broken piping and replacing it either with larger steel pipes or with concrete and masonry culverts. This meant careful attention to the traffic overhead, especially during the rains. One way and another, we were kept pretty busy.

Umtali was the headquarters of the administration, engine shops and offices, as well as staff quarters. There was no proper water supply for the settlement, and the long straggling street which constituted the town itself was in the same plight. A gravitation scheme was therefore laid by the engineering staff of the railway. Several intakes were built, tapping various streams 800 feet in altitude above the town, and extending into the mountain range as far as the nearby Portuguese frontier. These were connected with the station at the bottom of the town four miles away by a six-inch steel main. There

was then no end to the variety of work on hand, which extended over nearly four hundred miles of country.

The site of Umtali in the early days was some twelve miles over the mountains from the present site, in the cup of the next valley. After crossing the Revue River in Portuguese territory, the line is almost a continuous maximum gradient until it reaches the frontier near Umtali, which is on the local watershed. The original project was to take the line up the valley to the north, and so through the Penhalonga valley to old Umtali. The watershed at the head of that valley was too high even for the maximum grade of 2% (1 in 50). To continue through the hill would have entailed the construction of a long tunnel, a thing always avoided in this type of pioneer line.

Cecil Rhodes decided that as the railway could not come to Umtali, Umtali should come to the railway. The location of the line therefore continued along an easier route from the Portuguese township of Macequece up the Menini river-valley to the present Umtali. The old ox-wagon road to Mashonaland also followed this route. The gradient up the valley from Macequece is maximum for nearly twenty miles, with the excessive curvature in the alignment usual when following the contours on the side slopes of a steep valley.

Compensation was made to the inhabitants of the old township who had to shift, or rather to those who wanted to move, as some decided to stay where they were. The change over was made in the latter part of 1897 and the early part of 1898, when the railway was approaching the present site.

The Beira Railway, when it was taken over from the contractors, Pauling & Co., in 1900, had as its first manager Colonel Beal, then resident at Umtali. In 1901, Mr. Charles Wibberley from the Argentine Railways was appointed General Manager. With him came Mr. Alexis Soley, who afterwards succeeded Mr. A. M. Moore as Chief Resident Engineer.

The original railway alignment to old Umtali would have served the Penhalonga and Rezende gold mines, but the new location meant that the mines were ten to fifteen miles from

the line on the far side of a very serious obstacle, the Christmas Pass. Early in 1902, it was decided to see what possibility there was of connecting the new Umtali with the neighbouring valley by rail. The only possible route was over the Pass, and I went over there as assistant to Soley, who took charge of the work of survey.

This proved to be an interesting problem. The survey showed that, after taking off from the station at Umtali, it was only possible to get over the Pass with a gradient of 3% (1 in 33) which, with the extremely heavy works entailed, made the scheme very costly, and quite prohibitive for a branch line.

My previous experience of the Christmas Pass had been the memorable night of my first trek, a couple or more years before. Things had changed considerably since those days, and with the advent of the railway there was very little ox-wagon traffic, except to the mines. The Pass was always noted for lions, as like all other game they usually cross a mountain range at its lowest point. As traffic lessened they became bolder, and several incidents had been recorded, among them that of a man who had outspanned his cart and six mules near the top of the Pass and gone to sleep as usual under the cart. He was taken by lions and never heard of again, although the mules were not touched.

During this survey I had an experience fit to take its place in the list of Christmas Pass stories. In the course of it I learnt literally what sweating with fear meant. Before, I had thought this was only an expression.

It happened one night when I was by myself. I had remained after the completion of the survey to finish some plans. There were only a few Africans left, and they were in their quarters about fifty yards away. I had no rifle or shotgun, and with me only my little rough-haired terrier bitch "Vick". The main camp equipment had already been sent back to Umtali, and I had just a single bell tent and canvas stretcher. I had turned in and was fast asleep when I was awakened by the loud protests of baboons in the rocks down the Penhalonga side of the valley. This meant either lions or leopards

about, more probably leopards, as they are the natural enemies of baboons, and there were a number in the district. The boys stopped their eternal low chatter, and threw on more firewood. They were evidently listening very intently, as I was.

Then came the unmistakable rumbling and the watery cough and sniff which told us that this was a lion. It seemed to be coming our way. Vicky, though taking great interest, remained perfectly mute. I lit a candle, and the rumbling came quite close, and then stopped. That is the moment, as I learnt so well in after years, when the lion begins to take a serious interest, and when, if he makes any noise at all, he turns ventriloquist. When he decides on the ventriloquist act, he gives an occasional light, blowing sound, with his muzzle close to the ground, and it is very difficult to tell where he actually is.

There was one audible circuit of the tent, and then silence. The only indication of his whereabouts came from Vicky. By this time she had come to a rigid point, her back was up, and she was so well up on her toes that she appeared to be standing on the tips of her nails. There was no weapon to grasp. I leaned over the side of the stretcher, straining to catch any sound from outside, at the same time intently watching Vicky. Every story that I had ever heard or read about lion and their ways ran through my head, including a rather apposite one told me by Robert Coryndon of a lion jumping on his tent—but at the time he was sharing it with another man, and I had only a very small dog for company.

Vicky, still at a dead point towards the walls of the tent, began to revolve slowly like a compass needle, moving each foot in turn in the same stilted position. Still there was no sound from outside. Twice in this way she made a complete turn, which seemed an eternity to me, and then came to a standstill pointing to my side of the tent. By this time, although it was a cold night, I was literally sweating with fear.

Then came the first sound, from the direction of Vicky's point. After his turns round the small clearing in which my

tent was standing, the lion had evidently retired to the edge of the bush again. I could hear his breathing, and the swishing of his tail in the grass. Vicky had been moving both by scent and sound. I could recognise neither until he stopped, and then there was no mistake. My little dog began to relax, ready for action if necessary, as she knew that a hunt was on and we were the hunted. The lion had probably winded her and was after her, as they are fond of dogs if they can get them. Luckily for us, he thought better of it.

After further nerve-racking silence, the rumbling started again as he moved away in the distance down the other side of the Pass. By this time the baboons were tuning up again on the far side, which told us his destination—possibly Umtali, to give the inhabitants a turn. They often did this in those early days. On one occasion a lion chased a donkey over some freshly made bricks, spread on the ground to dry before being kilned. A lot of bricks were spoilt in the course of the hunt, but some very good specimens of lion spoor were imprinted, and some were baked and at one time kept on show in the Umtali Club nearby.

The morning revealed that our night's visitor had circled round about four yards from the tent in the clear ground, and the sandy soil accounted for the silence of his movements. He was certainly closer than I cared for outside a Zoo, especially at night. Then the lion looms large and man feels small, a reversal of the day-time ratio.

After that little adventure I thought it as well to have a weapon in camp in case this was the Christmas Pass lion himself. This name was given to an animal of evil repute, although the various incidents attributed to him in that region may have been done by a series of other animals on their passage from one valley to the other. Apart from this, when working in the bush or veld I seldom if ever had a weapon with me, as I soon learnt that working and shooting were two different things, and it was essential that they should be kept distinctly separate. Undisturbed game, including lion, is not aggressive, and only on a very few occasions did I have any trouble in all those years. Most of these were due to my

own carelessness, and were principally my fault in getting too close to a female with young. The majority of lions that I have seen in my travels—some of them at very close quarters, and usually when I carried no weapon—have been anxious to escape notice, at least in the daytime. The position is different at night.

At about that time, I unconsciously interrupted a church service one evening in Umtali. In those days Rhodesia was blessed with some splendid members of the Church of England clergy, who were greatly liked and respected. Among them were Bishop Gaul, in Salisbury, Archdeacon Beavan in Bulawayo, and the Reverend Mr. Roxburghe in Umtali. All their services were always well attended. While I was in the Christmas Pass camp, I felt one Sunday at the end of a long day's work that some religion would not be amiss. I rode into town, and tied up my pony outside the church among the animals belonging to the rest of the congregation, about forty altogether. All went well until the sermon. Roxburghe was an exceedingly good preacher, and well worth hearing. I listened with attention to begin with; the next thing I knew, a friend of mine who was taking the plate round touched me on the shoulder, saying in a stage whisper, "Time to get up!" I rose hurriedly in the middle of the last hymn. I was at the back, and occasional glances round from those in front made me suspect that the worst had happened.

Confirmation of my fears was not long in coming. I naturally went to Roxburghe to apologise, and he told me his side of the story. After I dropped off, he tried to keep going, raising his voice and endeavouring to time and then anticipate each snore. He continued bravely, raising his voice ever higher and higher, until at last no further effort was possible. He had finally to drop out, giving up the unequal contest, and announce the last hymn.

A sequel came a few days later, when I was working near the road on the other side of the Pass. Tim Hurrell, the Native Commissioner, came riding towards me along the track. As he saw me he started laughing from afar, and kept it up until we met. By that time I was rather stuffy, and told him

I considered the joke was now over. He said that on the contrary I had not yet heard the best of it. In those days, church-goers living outside the town came in on horse-back, or in some sort of conveyance. Hurrell himself had a cart drawn by a very smart pair of donkeys, which were duly tied up with the other animals outside. The Hurrells were sitting in the front of the church that Sunday evening, and midway through my unfortunate lapse, Mrs. Hurrell nudged her husband and said:

"Tim, I *told* you you had tied those donkeys up too tightly, and now they're choking."

The laugh was certainly against me, and I had to join in.

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All this time, works were in progress throughout the length of the main line from Beira to Salisbury. Deviations were being made, permanent bridges and culverts built, quarters erected, and all general improvements were under construction for the completion of the line. This provided a great variety of work, both in the office and in the field. It was a very valuable range of experience for a young engineer, and I took the fullest advantage of it. The hours were long, and we worked all day and every day. The only recreation was shooting, if one felt like it, and if there was time. There was big game and small game all along the line, but we only shot for the pot.

With all these improvements there still remained a major obstacle, which had been a serious obstruction to the continuous running of the line since its commencement. This was the crossing of the flats of the Pungwe River Valley between Mile 28 and Mile 41 from Beira.

The Pungwe River rises in the highlands to the north-west of the Moçambique territory south of the Zambesi, not far from the Rhodesian frontier. By the time it reaches the coastal plain, it is a river of considerable size. The plains through which it runs are of black alluvial cotton-soil. Like all similar rivers traversing the same type of friable soil, it lengthened its course to adjust the rate of flow, avoiding

excessive erosion. After its entry to the plains, the course of the Pungwe is extremely tortuous. The presence of many old lagoons is evidence that the river has changed its course in places a number of times.

Although thirty-five miles inland from Beira, the level of the plains near the river bank is only a foot above the high spring tides. During March, when the river is in flood from the rains up-country, coinciding with the spring tides of the equinox from the coast, the plains become inundated and remain so for several weeks throughout the heavy wet season. The railway runs through this flooded portion between Mile 28 and Mile 41, crossing the river itself by bridge at Mile 35.

This original bridge-crossing was situated on a very sharp horseshoe bend in the river, which, with the swamp approaches on the east, was nearly a quarter of a mile long. To the east, inside the loop, was heavy tropical bush, while to the west was the open cotton-soil plain. Here the river cut into the steep bank at the rate of forty to fifty feet a year. This necessitated continual lengthening, in spite of various attempts to prevent erosion. The distance from the coast by water was nearly fifty miles, and during the equinoctial tides there was a rise and fall in the water of seventeen feet, accompanied by a bore on the river, so the alluvial banks were constantly undercut. The original bridge was a timber trestle; it was reputed, in that unhealthy country, to have cost a life for every sleeper on its surface. The death rate was certainly very high, so much so that questions were asked in the Houses of Parliament as to the mortality among Indians alone who had been imported as labour for the work. After the trestle had been continually washed away, it was replaced by continuous plate girders of fifty foot spans on screw pile piers. This too proved unsuitable, and was replaced by one of larger spans which remained in position on the old site for over thirty years, until the whole line was deviated to its present location.

The formation of the original line across the flats was too low, with the consequence that in periods of flooding the track was under water for seven miles on either side of the

river, and all traffic had to be suspended. At times, the mails were sailed across the water standing over the permanent way, the only guide being the line of telegraph poles which, in that time of flood, rose from the water festooned by clinging snakes.

This regular annual stoppage of traffic was not only a source of annoyance but a serious loss of revenue to the company. After a considerable and expensive delay caused by the floods of 1902, when the line was under the new manager, Mr. C. Wibberley, it was decided that immediate steps must be taken to prevent any recurrence in the future.

Accordingly a scheme was prepared and estimates made to raise the line above the flood level and to extend the Fontesvilla bridge, with permanent spans to replace the temporary works on the western end, where serious erosion had taken place. A number of steel bridges with spans of twenty to thirty feet, already on the line in the submerged area, had to be raised or rebuilt. All this meant a considerable capital expenditure, for which, at that time, funds were available from revenue.

The chairman of the Company, Mr. Alfred Beit, was due on a visit, and it was decided to carry out two miles of the proposed scheme near Fontesvilla, so that he could see what was required and decide if the necessary funds for the completion of the whole scheme should be allocated. The next thing was to find an engineer who would live and take charge of the works in that unhealthy country. From the earliest days of the construction, the mortality from malaria and dysentery had been so great among both white and African employees that a bad name still clung to it. No one was keen to go down there from the healthier highlands of Rhodesia, and seniors on the engineering staff found pressing reasons to prevent them from taking on the job. An engineer was therefore contracted for in England, and came out by sea to Beira. While the ship was in Beira, he went up to Fontesvilla, having heard tales. When he had seen the country, he remarked that he knew of better places to die in, cut his contract, and sailed home by the same ship.

I had lived down in that country before, and knew it in its various seasons, and it was certainly not an attractive spot at any time. It was swampy in the wet weather, and in the dry months, with the ling grass burnt off, the hard black clay cracked everywhere. Except immediately to the east of the river, there was not a single tree in sight for seven miles on either side. It was certainly lacking in appeal for anyone who had come straight from the green fields of England.

I had had a lot to do with the office work of drawing up the plans and estimates for the proposed scheme, and although I was somewhat junior to take full charge of works of such an extent, I suggested that I should be given a trial as I knew the living conditions in the country as far as it was possible to do so. My suggestion was approved, as there had been much delay in starting the experimental work, and now we could get on with the work during the dry season, and before the arrival of the members of the Board from England. I was naturally delighted as, apart from the interest of the work that lay ahead, it was in the heart of the best known game country of the time, with big and small game on the plains, and wild fowl galore on the lagoons.

Sympathy was offered me, and all sorts of gloomy predictions were made, based on hearsay of the country, by those who had never been there. The malaria cycle was not yet fully understood, and the idea prevalent then was that the more virulent forms of malaria were caused by living near, or disturbing, mosquitoes. As in this case the work entailed cutting through primeval swamps which had lain untouched since the beginning of time, little hope was held out for my survival.

A certain amount of survey and information was still required before the work could be started, so I took up my abode in a wood-and-iron shack, ten feet by ten feet, raised on piles five feet above the ground about fifty yards from the banks of the river, in a position slightly higher than the surrounding country. The mosquitoes were very bad, and it was extremely damp, even in the dry season, as the thick river

mists did not clear until several hours after sunrise. In the daytime, on the plains of black cotton-soil, the sun was unbearably hot, so instrument work was best done in the early morning.

Two steel spans on screw-pile piers had to be added to the existing bridge to replace the temporary wooden trestle, and the line had to be raised throughout the fourteen miles of plain from three to seven feet. All this had to be done without interrupting traffic. With the exception of the weekly mail train, which ran in the daytime, the goods trains were run at night, thus leaving the section free for reconstruction work during the day.

During the time that I was engaged on these preliminaries of survey and estimates, I had to prepare for the proposed system of raising and completing the line, with the type of openings to be adopted, and have all ready for the approaching visit of the chairman and his party, hoping that he would grant the finance to complete the work.

The party arrived in due course at Fontesvilla. It consisted of Mr. Alfred Beit, chairman of the company, Dr. Jameson, Mr. Jones, the secretary of the chartered company, Sir Charles Metcalfe, the consulting engineer, the late Lady Howe and her sister Lady Sarah Wilson, who had been through the siege of Mafeking, and Alexis Soley, chief engineer of the railway. With the exception of Soley, the party had travelled up from South Africa via Bulawayo. The Rhodesia Railway was then under construction from both Bulawayo and Salisbury. About fifty miles from Bulawayo there was still a gap between the two sections, which they had covered by the old stage coach. The party was among the last to use the old type of transport on that route.

I took them over the works, which were sufficiently advanced to illustrate the general idea, and Mr. Beit was sufficiently impressed to grant the estimated capital required. I saw times of great interest ahead.

Dr. Jameson was more interested in the game in that district and asked me many questions, while the ladies paid more attention to a litter of Irish terrier pups of mine, who were in a

box under my shack, and had narrowly missed destruction by a hyena the night before. The party then went on to Beira to join their waiting ship. They asked me to accompany them, but I had to refuse, much as I would have liked such a break just then. It would have meant too long an absence from all the men on the work, and I was single-handed.

Sir Charles came up and stayed with me in my small shack for a couple of days. He then told me of the success of the preliminary works, and the decision regarding the money, which was not so easily obtainable in those days.

The wet season with its floods was at hand, but by then everything was set to start on the main works the following year. Materials had to be ordered for this, and various plans completed. It was proposed to make a start as soon as the floods had subsided. For the time being, during the rains, I was transferred to Salisbury to take over the maintenance of the Ayrshire line which had just been completed to the mine of that name. The new line was one of eighty miles, to the north-west of Salisbury, crossing the Gwibi River and passing through the Umvoke Hills on the way. The material used for the construction of this line was that of the old 2' gauge removed from the Beira Railway. I also had the main line as far as Marandellas to look after. My headquarters were at Salisbury, and with this light work, I was able to continue on the scheme for the Pungwe Flats, of which I was now in full charge.

For that type of light line, the first wet season is always a little trying, like all babyhood days. This one had its teething troubles as soon as the rains started. There were washouts and derailments, so it was fortunate that there was not very much traffic. On one particularly bad derailment due to the subsidence of the track in a swamp, the engine sank so far that it seemed as if we should have to wait until the dry season before we could dig it out. As there were washouts on the Salisbury side as well, we could not get assistance from that end. A breakdown gang was organised at the Ayrshire mine ten miles away, and arrived with its jacks and gear on the scene of the trouble in an ox-wagon! That was my only

experience of such a desperate remedy, and I have never heard of such a thing being necessary anywhere else.

A herd of elephant that used to roam the Umvokwe Hills occasionally gave us trouble. Not only did they pull up the telegraph and mile posts, but in places they even lifted the light track out of the sandy soil. Eventually as settlement spread in that part of the world they had to be destroyed.

Towards the end of April the floods had sufficiently subsided on the Pungwe Flats to enable us to make a start. Steelwork, cement and other materials were already at Beira. Some of the men who had been with me on the initial works during the previous year were still available, but the bad reputation of the country still held, and it was difficult to get others to help in cutting through the swamps. Eventually I acquired some thirty men to make a beginning, a mixed lot including Greeks, Italians, Chinese carpenters, and a few English, Scots and Irish. O'Flaherty was among the latter.

Some were generally steady and reliable, others occasionally caused trouble and always through the same failing; but between their bouts they would not touch a drop, and would each do the work of two men. It was a poor sort of life for them, camped with a gang away out on an open plain, fiendishly hot during the day with not a vestige of shade, mosquitoes and lions at night, and no amusements whatsoever to break the monotony. Men who could stick it were not easy to replace. As others have found in positions similar to mine, I would rather tackle that sort of life under such conditions with men whose faults are apparent than with others whose failings are not. The secret was to mark them down in time. The first sign was usually when they started drinking the local toddy, palm wine made and brought in from the bush beyond. Toddy taken directly from the palm is a delightfully refreshing drink, but after a day it starts to ferment and becomes heady. Eventually it becomes extremely potent, and that is when the trouble starts. On the first appearance of the danger signal, I would suggest a short holiday in Beira. This was invariably greeted with a protest, as they were genuinely interested in the work, which had settled into a hustle-and-go

swing. The usual query was what would become of the gang in their absence. I would give a guarantee that the gang would be well looked after, and there would be no trouble. After some days, possibly a week, a dishevelled individual would reappear from Beira to report for duty, only too anxious to get down to work again, and from then things would go at the double until the next break.

The Greeks and Italians did not suffer from this failing, but they had their own little upsets among themselves. They were no trouble on the work, as they had a holy fear of Jimmy Lawther, or as they called him, "Mr. Jimmee". Jimmy Lawther was my only assistant on the works. He had originally been first or second officer in the Union Company's ship *Norman* when she was first commissioned. He left the Merchant Service and went to Johannesburg, where he made a lot of money and lost it all, then joined a stevedoring firm in Beira, and finally came to me. He was a first-class boxer, and in his sailing-ship days had learnt to deal with men of many nationalities. More than once, when there was an argument, he would tackle it in the traditional sea-faring manner, and take the chance of a knife coming his way. In his earlier days, he had served in pilgrim ships to Mecca, which had given him added experience. He did the general work of time- and store-keeper, and anything else that came his way. His knowledge saved me a lot of trouble with the actual labour, and left me free to deal with the technical side, which occupied me fully during the entire day and part of the night.

Gambling was our chief trouble with the southern people. Standing out on the plains, a hundred yards from my hut, were a couple of stores, run by a half-caste and an Indian. They were miserable shacks of galvanised iron, with shutters for windows, standing on five-foot piles off the swampy ground. On Saturdays, as soon as work was over, the Greeks and Italians would head for the half-caste's place and start playing poker. The game continued night and day until dawn on Monday morning, when they returned to the works.

After the monthly pay day, sharpers would come up from Beira to these parties and take most of their month's wages,

which was usually quite a considerable amount, as they were on task work. I could say nothing to convince them that they hadn't a chance against these fellows. Occasionally the more cautious would come to my hut at night after pay day, and ask me to keep a sum for them. Then, after a gambling bout, they would come and beg me to return it. In most cases I would refuse, and keep the money until the end of the work, much to eventual gratitude.

These week-end parties were not without incident, and on more than one occasion knives came into action. Once there was shooting, and some of the shots accidentally came my way. Their private affairs were out of my province, but this was rather over the odds, so I sent those responsible off the works. There were no trades unions in that part of the world, and discipline was what you made it yourself.

Another incident affected me personally, and might have been more serious. A Greek had a fancied grievance against me over some difference we had had concerning his work. He evidently brooded over it, and one moonlight night paraded in front of my hut with a gun, inviting me to come out and be shot. I informed him that I also had a gun, and could see him very much better than he could see me, and that I would start the shooting, which seemed the obvious line to take. Eventually some of his countrymen appeared and took him away. He too went off the job.

A feud between a Greek and a Southern Italian developed into a nuisance, although they were miles apart on the work. Sides were being taken, and as often happens in out-of-the-way places where life is isolated and monotonous, the affair grew out of all proportion.

A climax was reached one day when the principals encountered each other in the store. Jimmy Lawther came in as they were both grovelling on the floor. The chap on top was well ahead, and had his thumbs in position to gouge the other's eyes out. Jimmy put an end to the contest and to the entire feud by laying him out quickly and efficiently with a stripped pick-shaft.

Once the works were well under way, there were some 40

white and 12,000 African employees with three ballast trains in continuous service. The general system of raising the line above the wet-season flood level was as follows: first, side slopes were made up from the side ditches which ran the whole length of the work; then gravel ballast, brought by train from the Siluvu Hills 40 miles away, was off-loaded on both sides. When there was sufficient, the line was lifted bodily with levers and jacks, two feet at a time, and the ballast alongside was shovelled under the track and firmly packed.

Where the construction of waterways was necessary, this lift had to be completed to full height in separate layers during one day. The track was lifted bodily, but instead of ballast, double baulks of timber $40' \times 12" \times 12"$ each, were placed end to end under the track and supported on cribs of timber sleepers. These cribs were spaced at a distance sufficient to allow for the subsequent construction of permanent abutments and piers, which was done under traffic. The approaches were graded up from the original level. Each timber opening, therefore, consisted of 80 feet of baulk-timber with approaches of 1-in-50-grade at each end, which enabled a waterway of four eleven-foot spans to be constructed below. As some of these groups of openings were less than 200 yards apart, the line in its earlier stages had the appearance of a switchback during this type of reconstruction—which could only have been accomplished on a straight and level track.

At sundown the line had to be left free for the passage of through traffic. When some of the heavier lifts, including openings, were constructed close to the original bridges, it meant a very full day, with "all hands and the cook" on the job. Inevitably the rolling stock suffered, but it was let off very lightly. Some of the trains of twenty-four loaded trucks, each over 40 feet in length, would rest on more than one lift simultaneously, as they passed. Coupling links then suffered casualties, but it was surprising in the circumstances how few were broken, and spoke well for the care taken by the drivers of night traffic. The completion of the concrete works was followed by the addition of the permanent steel spans and

decking to the openings, then the whole line between them was raised to the required level in successive lifts. Though derailments might well have been expected on this class of work there were none during the whole time that it was in progress.

At the same time, the bridge of the Pungwe was being lengthened to two fifty-foot spans, to allow for the heavy scouring of the right bank that had taken place during the preceding years. This entailed sinking piers consisting of bents of six screw-piles, 6 inches in diameter, and 70 feet in length. These, when braced together, formed the piers on which the through spans rested.

This bridge was later replaced, over the actual channel of the river, by larger spans on cylinder piers. The original one was not satisfactory on that type of waterway, which was tidal with a range of 17 feet. The piers of the old bridge were set every fifty feet, with cross-bracing which held up every sort of floating matter, while the bottom of the girders was only a couple of feet clear of flood level. When the water was up, gangs had to be kept continuously at work day and night, breaking up the islands of sudd and vegetation so that the flotsam could pass through the restricted openings. Luckily there was always warning of the approach of floods from up-country with the appearance of yellow flowers, similar to the Nile cabbage, floating down the river from the shallow lagoons above—the only place where they grew.

At times the islands of sudd were big enough for men to walk over when cutting them up. The chief danger then was from snakes, of which there were many as passengers.

On one occasion, an African was bitten by a particularly venomous species, possibly a mamba. His fellow workers took the matter in hand themselves, and dealt with him promptly in what seemed a rather drastic manner, but one that was undoubtedly efficacious. They cut his gums, lips, and any place where he would be certain to bleed freely. Although at the time he looked like dying, after the third day he began to recover and eventually was completely cured. I have seen various methods used by Africans in dealing with

snake-bite during my travels in other parts of the continent, but that was my only experience of that type of treatment.

Somewhere near the Zambesi river there is a tribe reputed to be either immune from snake-bite, or to have some secret means of immunising themselves. On the works through the patch of tropical bush at the approach to the eastern end of the Pungwe Bridge, I came in contact for the first time with a member of this tribe.

Walking along the embankment while the bridge was being raised, I stopped to talk to the ganger in charge of the labour, some of whom were even more raw than usual, and had come to us from a remote part of the Lower Zambesi. When we had discussed the work in progress, he told me that a large snake had just taken refuge in a hole in the bank, and now was my chance to see one of these snake specialists exercising his powers. The other natives on the work had run off, saying that this particular specimen was too quick and too deadly to be trifled with. But an extremely raw African of this Zambesi tribe, who had recently arrived and had not yet earned enough to replace his scanty kraal clothing of bark and skins, came forward and offered to go into action. We went towards the hole where the snake had taken refuge, and viewed it from a reasonable distance. Its head could be seen facing outwards.

Without hesitation, the native walked up to the hole, took a casual look, and plunged his hand and arm straight down into the depths. When he withdrew it, there was an extremely angry reptile in his grasp, coiling itself like a flash round his arm as soon as it was free of the hole.

The man had evidently caught it too far back, as it had sufficient freedom to raise its head and strike its fangs hard into the fleshy part of his left hand between the thumb and the first finger. He gripped it gently with the other hand and withdrew the fangs, but it freed its head again and immediately struck once more, close to the original wound. There were now four distinct fang marks on the hand. A very few moments later, he had it completely under control, resting coiled up on his outstretched hands. He brought it towards

me to be examined, approaching with his arms fully extended until he was only four feet away.

My own boys, with a perfunctory warning to me to be careful, headed for the skyline. Personally I felt that this was closer than I ever wanted to be, but I did not care to show my reluctance too obviously. I told him, through the medium of the ganger, that I had seen as much as I wished to, and he might now kill the snake. His reply was that he would not kill it, as if he did, the next one he encountered would kill him. He then walked a couple of hundred yards down the track, clear of where the gangs were working, and tossed the creature carefully with both hands into the long grass. He paid no attention to his wounds, but returned at once to his pick-and-shovel work.

I was particularly interested to know if there would be any after-effects, and saw him on several consecutive days after the incident. The wounds healed in a perfectly healthy manner in a few days, much the same as any other ordinary flesh wound.

The ganger told me he had had several similar experiences with this particular tribe, and although he had tried to discover their secret, being very much impressed, he had only received evasive replies. This is the usual experience of the white man when he tries to extract any secret lore from the African. Very few Europeans gain their confidence sufficiently to be given true information. The ganger, however, persisted undaunted, with further requests and offers of reward, until finally he was given a brew which he rather unwisely sampled. He never found out what kind of poison it contained, but he was laid up in hospital, extremely ill, for several weeks. At the time I knew him, he had not yet experimented to find out whether he was immune or not!

The dry season was by now well advanced, the work going full swing, and all workers really putting their backs into it. They were interested in our progress, which was developing into a race with the coming rains. We had had practically no sickness so far, but so bad had been the reputation of the district that the authorities, who had entered Rhodesia from the south, or had come from such healthy countries as the

Argentine, had developed a fear of it. When it was obvious that all was going well, they were only too glad of an excuse not to pay personal visits, so I was left, to my great relief, in full control.

Hours were long out on the works—from sunrise to sunset—and my office work in the evenings continued at times well into the night, and sometimes encroached on my Sundays. Occasionally there were slight hitches, as was only to be expected, but these generally righted themselves.

Once a swarm of wild bees invaded Fontesvilla and took charge from dawn to dark. Those in mosquito-proof huts had to stay there, while those outside made their way out of reach at the double. Ballast trains were held well clear of the station until sundown. All living things, goats, hens, ducks, etcetera, were chased well away on to the plains. Some took refuge in the river and were taken by crocodiles. One wretched pet monkey belonging to a man out on the works was unfortunately made fast to his tent, and was stung to death. Only at sundown did we return to normal, but that was the only occasion on which bees became absolutely uncontrollable. Once a swarm clung to the bottom of a ballast truck, in a solid cone about one foot in height and one in width. The truck, of thirty tons capacity, was loaded at a ballast pit forty miles away, amid all the dust and turmoil of such a place. It travelled down the main line, over the rough, vibrating construction tracks, off-loaded and then returned to the ballast pit. The bees made this double journey twice, enjoying a free passage, while the train crew and gangs were in deadly fear, and everyone was extremely careful not to disturb them. It was never discovered exactly when and where they left their mobile sanctuary.

At about this time, during the construction of the Uganda Railway through Kenya, there was much trouble with loss of labour through lions, who terrorised the Indian coolies, and took them at night out of the compounds where they were lodged. The story of this was published in the book called *Man-Eaters of Tsavo*.

During the work on the Pungwe Flats, I had the same

There were a few professional hunters who took parties out to the shooting grounds, looking after their clients in much the same way as the "white hunters" of East Africa at a later date. There were some curious characters among them, all of whom achieved a contemporary fame. Among them were Fred Johnstone, who was eventually killed by an elephant; Paulin the Frenchman, who was a dead shot, and one of the first men in those days to shoot with a light rifle; and Dan Mahoney, the Irishman, who killed thirty-four lions on the Gorongoza in one month. I did my first shooting in that country with an old sporting Martini rifle that had belonged to him.

"Bloody Bill" Upscher was a large powerful man, with no eyebrows, no eyelashes, and not a single hair on his head. From him I learnt the basic use of eyelashes and brows, provided by nature for keeping the sweat out of one's eyes; I appreciated my own luck in having them, and sympathised with one who had not. The lack was a serious misfortune, and particularly inconvenient when crawling on a long stalk after game on blistering hot days.

Little Jean Menaut—"Johnnie" the Frenchman—was very short and broad, with a long black beard. When he was not hunting, he ran a shack called by courtesy an hotel, at Bamboo Creek, at which some of the engine-changing station hands used to board. The principal and eternal item of his cuisine was buffalo meat, no matter what other name it assumed on the menu. At one time Johnnie had had a serious encounter with a lion, which had mauled him severely. Judging from the scars, he had been extremely lucky to survive. When he was stripped to the waist, the skin over his powerful back and chest looked more like a mess of macaroni than a human covering.

Larsen the Swede was one of the first train guards on the old Beira Railway in its early days. He turned hunter, but was more of an ivory hunter than a professional guide. Larsen had trouble with some natives, and shot them up when they tried to take over an elephant he had killed. After that he had to get out of the country. He went north, and as the

boundaries of the countries of Central Africa were then still undefined, and the territories themselves were practically without administration, he, like several others, had a great time poaching ivory wherever he could find it. Once when he had news of a herd not so very far away, he asked me to join him on a hunt, as his camp was then not far from mine. Unfortunately I was busy at the time and could not get away, much to my subsequent regret, as he came back in less than a week with over five hundred pounds' worth of ivory.

He worked his way across Africa towards the west, having several differences with the various governments *en route*, until he reached Angola, where I saw him just before he was killed. He had made a considerable sum out of his ivory, spending most of it on expensive rifles made for him by the best gunsmiths in London. One of these was a .600 high velocity cordite rifle, a veritable cannon, and possibly one of the few ever made. I fired it once to get the feel of it, and immediately wished that I hadn't. It was a formidable experience, and I was in doubt afterwards as to which end I had held at the time.

When Larsen caught up with a herd, it was pure slaughter. He was accompanied always by a native woman, Maria, and a half-grown boy, Jim, both of whom had travelled across Africa with him from the Zambesi. All three went into action together with his heavy-bore rifles, and literally blew the herd up. When following a herd, which is really hard work, he was capable, if necessary, of going without food, hat or boots. He met with a terrible end in Angola, the result of a native poison given to him in a fit of jealousy by a half-caste woman. There were no doctors available, the actual nature of the poison could not be ascertained, and it was several days before death released him from his torture.

As the East African territories opened up, with their greater accessibility and healthier conditions, hunting in the Pungwe country became less popular, and the few professional hunters who remained either disappeared or left the country. It was always hard going there, as the only method of transport and therefore of hunting was on foot, with native carriers. No

animals, neither oxen nor horses, could live in that district, which was infested with tsetse fly.

Although I was actually living in the midst of one of the best big-game countries then known in Africa, the extent of the works on which I was engaged and my lack of assistance did not leave much time for the chase. In spite of restricted opportunities, however, I can never complain of the amount I managed to fit in during my time there.

Shooting as I was for meat, and not for trophies, I soon got over that initial and contagious "buck fever" that attacks the novice. I never left any meat to waste, as all was consumed by the labour on the works, who were only too glad to get it. Sundays were the only days when I had any time for shooting. One of my inspectors on the works was a quiet, fair-haired Italian from the north of Italy. The little spare time he had was always occupied in hunting, and I learnt a lot from him in those early days, as he knew the country as well as he knew the game. On Saturday evenings we would go along the line to wherever game was most plentiful at the time, sleep out for the night, and each take a separate side of the line to hunt. Before the morning light we would be well away on the flats, as after 9.30 or thereabouts it was usually too hot to hunt any more. It was not such easy work. Sometimes there were wounded animals to cause delay, as none were allowed to get away. To ensure this we came as close as we could on the stalk before shooting to kill. As each animal was shot, one of the natives with us would be sent back to fetch others, who took the meat back to a central spot where it was cleaned. After cleaning, it was rinsed with a solution of boracic, which hardened the outside tissues, and prevented the flies from settling. This was sufficiently effective, even in that hot climate, to keep the meat for a day or so longer, in fact sometimes it was still good on the following Thursday. It was then taken by ganger's trolley, or train if there was one, to Fontesvilla, where a white ganger cut it up and distributed it along the works. In this way sport and utility were combined, and there was a reasonable limit to the day's bag.

My first rifle was the old one I had got from Dan Mahoney,

a very-much-worn sporting Martini. It was not very reliable, and the black powder ammunition was not easy to get. It was, however, a good weapon for a beginner, as it taught me to get as close as possible before firing, to avoid the tedious following of a wounded animal. Its age and condition did not allow of long shooting. When I got to know it, I did as much or more execution as with high-powered rifles in later years. I was fond of it, and its heavy leaden bullet either missed or hit so hard that if I did not kill outright, the heavy blood spoor made the following-up process much simpler, not always the case with a nickel-covered bullet.

It eventually let me down, and reluctantly I had to give it up. It happened at Mile 46, where there was an overhead tank for engines, a siding, and a ganger's cottage. The water tank was fed from the Muda River, at that time and in that place a shallow stream some five yards across, running through reeds in a sandy bottom about fifty yards wide, edged with banks about twenty feet in height. To the south of the river was one of Selous' hunting grounds, and closer in was one of my favourite patches for game. I had killed several large buck which had been taken to the line to be cleaned and made ready for transport. It was early in the season, and apart from being hot, I was still soft from my stay up-country. I was on my way back alone, when near the river I came across some oribi, which, for one's own larder, are far better eating than the larger buck. They were not far away, on the other side of the anthheap on which I was lying.

I selected my animal and fired. There was a famous sketch in those days called *The Fancy Dress Ball*, in which Dan Leno struck a fellow dressed as a Life Guardsman, who had taken his girl. To quote Dan Leno, "All the lights went out, but mark you, when I came to, they were gone!" In this case, I came to, very dazed, with a cut cheek, and the oribi, like the Life Guardsman and his girl, had gone. The cartridge, one of the very old-fashioned sort with a thin brass casing and black metal cap-rim, had evidently come apart in the chamber with a burst, producing a kick that had laid me out completely.

After this little mishap, I lost all interest in the chase. As I had only one cartridge left, I was not anxious to try any further experiments that day, and set off home towards the tank and siding, which were a couple of miles away across the river. I descended the steep bank of the river, and ploughed through the reeds to the stream. On the near edge, fresh in the wet sand, was the spoor of a lion and lioness, who had probably been disturbed by the recent shooting, and had just crossed at the spot that I had chosen. The spoor showed that, with the usual disinclination of the cat tribe for getting wet, the lion had cleared the stream, while the lioness, after walking up and down in a state of indecision, had jumped short and hit the water. There was a trail of water from the river's edge up the face of the bank, which showed they could not be far off.

Still feeling the effects of shock, and practically unarmed, I had no desire to meet them, but I knew that at that time of the day, and being wet to boot, they would be lying up in the vicinity. When I got to the top of the bank, I had a good look round. Sure enough, on the sunny side of an anthep, they lay watching me from a distance of about fifty yards. We eyed each other, but they had the advantage. I then embarked on as good an exhibition of a crab step as has ever been witnessed away from the seashore—half a step forward, half a step to one side, and then an agonised shuffle to repeat the performance, until I had put enough distance between us to retreat in a more dignified human manner, without undue haste. For once man was the performer before an animal audience, who undoubtedly occupied the front seats. I bore no malice towards lions thereafter, in fact I grew to know them as very pleasant animals; but I have always had a fellow-feeling for them since, and hate to see them in captivity when the position is reversed, and they are being put through circus tricks for man's amusement.

That was certainly a day of bad luck for me. First I was knocked out, then I missed probably the best chance of bagging two lions that anyone could ever hope to get. But there was more to follow. I eventually arrived at the tank nearby, where the ganger's hut was occupied by an old Italian

who had prepared all the meat I sent in for transport to Fontesvilla, twelve miles away. He told me that elephants had just been there, and he had had to take refuge in his hut. Elephants did occasionally pass that section of the line in their periodic travels to new feeding grounds to the north or south, according to the seasons, but they did not usually stay for any length of time. When I questioned him, he was most emphatic about their presence, so I went to see the spoor.

Sure enough, there was the spoor of a big bull, only 120 yards away from the hut, and a number of smaller prints. I asked the old man what steps he had taken, and he told me that he was extremely frightened, and had retired to his hut and fired a gun, which had scared them off. By that time, of course, they were probably miles away, and as I was still rather shaken after the rifle episode of the morning, I retired to the hut and slept for several hours. I did not feel equal to a chase after problematical elephant at that time of day in the hot sun, and used my remaining energies in reproaching the old man for not awaiting my return.

My luck was out again, for the third time that day. About two miles away there was a big lagoon, full of wild-fowl, which I knew well and used often. The elephant went only as far as this water, and then stopped for the day. A passing native saw them, and took the news to the station-master at Bamboo Creek, who promptly knocked off work, got a ganger's trolley, and set off with a telegraphist and rifles. They descended on the elephant at sundown, and cleared up nearly £500 worth of ivory while I was sleeping only a couple of miles away.

That was my last day with the old Martini, as soon after I was able to get a more modern cordite rifle, the first of several. I never had the same feeling for these, though, as I had for my first love. Although it had let me down so badly, it was through no fault of its own, and it had taught me a lot in the interval.

Wild-fowl was plentiful, and easily accessible in the lagoons on either side of the line. It gave us a very pleasant change of diet from the eternal buck meat, and was an excellent antidote

to "buck fever". After a time I found I would rather shoot duck than buck. I only cared to shoot when meat was really necessary, as it was apt to interfere with the work, of which there was plenty. When the first enthusiasm waned, one began to specialise, and to be interested only in getting a rare species or a special head required by a museum. Trophies, when living in the bush, are a nuisance to keep and to transport—although if there was anything worthwhile lying around in the camp, visitors usually spared one this latter problem. Shooting as such is more or less a social affair, and if one was acting "white hunter" to show a friend some sport, one would only take glasses to help spot the game. Hunting is an entirely different thing; it means the pursuit of one specimen only, and then the ideal party consists of one.

In the dry season, when the lagoons were low, wild-fowl shooting was at its best, and sport was good especially when there were others to join in, as for example when a shooting party passed through my camp. It was necessary to know the flight of wild-fowl from one lagoon to another, and post the guns accordingly. We would travel along the line on a ganger's trolley accompanied by natives until we were as close to the water as possible, then strike across country and wade in to a likely bunch of reeds to take cover, standing two to three feet deep in the lake. There were no crocodiles, but there were big mud barbels, sometimes over three feet long, and their frenzied dashes through and past our legs were most disconcerting until we grew accustomed to them. Later when the lagoons dried up, these barbel would disappear under the mud and remain there until the following rains. They are a valuable source of food to the African, and an article of trade in all swamp countries, such as the Pungwe, and the headwaters of the Zambesi and Congo rivers.

Once installed in a suitable place for cover and view, although there were plenty of other wild-fowl swimming in ignorance close by, we would wait for the geese to come in before beginning to shoot. Those evenings still live in my memory—the glorious sunset colouring, the scent of the lagoon flowers, the chattering of the wild-fowl, the troops of

buck, large and small, stepping daintily down to drink at the water's edge, the squelching sound of warthogs and pig wallowing in cool mud after the heat of the day. It seemed a crime to disturb nature in such a peaceful mood.

Presently the first geese would show up against the glow of the sunset, flying in closer until they were within range of the guns. With the first shot, all chattering ceased as duck and fowl took to the air, and animals vanished from the water's edge. Then we enjoyed a very busy ten minutes until the last glow dwindled and darkness fell. All the retrieving was done by the natives, who marked the fallen birds from afar, and missed very few. They did not seem to mind gathering them in before the final shooting, and showed as much keenness as the guns.

There was nearly a tragedy one evening, while one of my boys was retrieving. He was dragging a number of geese and fowl in each hand along the surface of the water, when I brought down a goose that came in late and low. It landed on the back of his neck, fifteen pounds of dead weight with all the momentum of its flight behind it, and sent him under the water. Fortunately the skull of the African is notoriously tough, and he was not completely stunned, or he would have drowned before I could have reached him. As it was, he had a very narrow escape, and was dazed for some time afterwards.

As soon as it was dark, the natives by the trolley on the line would light a fire to guide us, and also for warmth. Although the days were hot, the nights were cold by contrast, especially after wading for so long. A change of clothing was on the trolley, and when we were dry, natives got busy on our legs with embrocation. The massage, combined with a long whisky and soda, set us up for the ten-mile ride back to camp, and so would end another memorable day. There was always plenty of variety in the bag, mainly spurwing geese, with an occasional Egyptian goose, and knob-billed duck, which the boys called the brother of the goose. Once a friend and I seemed to strike the spot in which every goose in the country wished to settle. In less than ten minutes we bagged

twenty-five geese and as many duck. Most of them fell to my companion, as he was a born wild-fowler and spent a lot of his winters in England shooting on the marshes of the east coast.

The larder at Fontesvilla was always well stocked with a wide range of meat—buck large and small, geese, duck, teal, guinea-fowl, francolin—a chef's dream, but alas with no chef to enjoy the realisation. We had an African cook, and although his methods were crude in comparison with European standards of *haute cuisine*, they were nevertheless effective. Dishes were evolved in that camp which have never appeared in any printed cookery book, but were always keenly appreciated by visitors who sampled them on their way up-country, shooting, and who asked for them again on their return. After over twenty years, when I was hunting in the Kildare country in Ireland, I met one of these visitors of younger days who was then a very senior officer at the Curragh. I had not seen him in the interval, and one of the first memories that we savoured together was that of the camp cuisine.

One item served either for *hors d'œuvre*, savoury, or a meal in itself, depending on how we felt. It consisted of a large square of bread—usually sourdough—which was toasted, or better still, fried—not in the ordinary way, but first dipped quickly in water and then plunged into hot fat. This made it crisp outside and soft within, and prevented it from flying around when cut, which is the usual embarrassing habit of fried bread. If toast was the choice, butter was then spread on it. In either case, the first embellishment was anchovy or bloater paste, then a slice of one of those almost flavourless onions, about three inches in diameter, cut to the thinness of tissue paper, then the fried liver of guinea-fowl, or any other suitable liver, and finally a stuffed, hard-boiled egg, point upwards in the middle. That was quite a popular number.

Another dish was contributed by an expert in the shape of an Italian, who possessed both the machine and the material for making macaroni, which he supplied to his fellow-countrymen on the works. He was an artist in cooking it as well, and always timed his efforts, watch in hand. As there was no

receptacle of sufficient size to accommodate the result, we generally used an enamel wash-hand-basin. Into this went first a layer of his special macaroni, then a layer of sauce of his own concoction, just as special, then another layer of macaroni, and so on until the right depth was reached. On top of the last layer of snowy macaroni he placed roast teal, one for each member of the party, which we could deal with as we liked. The combination was superb.

Wine was cheap in those Portuguese territories. An anchoress of red Collares wine, containing 56 bottles, cost about 24/- including the barrel. Whisky was 5/- to 6/- a bottle, so the commissariat presented few problems, and living was comparatively good. Camp hospitality always seemed to be greatly appreciated by all the parties who stayed with me on their way to and from the shooting grounds.

Working on the extension of the Pungwe River bridge, I had a foreman who was a great character. He was a French-American from the Southern States, and his name was Creeyer. No one ever seemed able to grasp this, and everyone called him "Kruger". He got so tired of explaining his real name that he eventually adopted Kruger in self-defence, and even signed himself as such, at least locally. He was a small, forlorn-looking man with a long, drooping white moustache and whiskers that gave him the appearance of a dissenting parson until one observed the occasional twinkle in his little eyes. This meek appearance, combined with a slow soft, Southern drawl, effectively disguised a quick, alert brain and an extraordinarily keen sense of humour.

He had an inexhaustible fund of amusing and simple stories which he told in his slow, quiet way, without a smile. All the characters seemed to live, whether fictitious or real, and we felt as though we knew them. Most of these tales began: "'Way back in my town" or "'Way back in my country.'" It was never difficult to find any of the young officers or other members of shooting parties staying at my camp on the way through. I had only to go down to the bridge-works to hear a sudden burst of laughter, and know that yet another had "bought" one of those deceptively simple tales. They

all adored the old man, and those I met in after life still remembered him with affection, although he had been dead for many years. Among other things, he had been a backwoodsman in Missouri in his young days, and there was very little he didn't know about woodcraft. He was still a very fine shot when I knew him, though he had long since given up shooting, having got most things in his day.

At about that time, an old Boer Commandant camped near us with two younger men, ostensibly looking for land to settle on in order to avoid the British in South Africa. By way of a living they were shooting the plains animals, hartebeest, wildebeest, etcetera, of which there were plenty nearby, and sending the carcasses down to the Cold Storage at Beira to swell the meat supply. The old man did all the shooting, the others accompanying him to prepare the meat. Sometimes in the evening, they would talk to old Kruger, whose name appealed to them, trying to impress him with the wonderful feats of the Commandant. Little did they realise that Kruger knew all there was to be known about the sport, especially in those parts. They spoke of how the game was shot through the head at a distance of several hundred yards, so as not to spoil it, though anyone shooting in that country knew that this was not necessary, as one could get all the meat required within easy range.

Old Kruger stood it very politely for a long time. Then one evening he broke in with a story of his own, which put a stop to all further conversation, either on shooting or on any other topic. I gathered that it began with the usual preface:

"Say—'way back in my country, in the Southern States, I did a little shooting as a boy. We had plains like this too, and had to do some mighty long shooting at times. We found that, for a really long shot—and it was all with muzzle loaders in those days—it was best to dip the bullets in boracic, or some other disinfectant."

There was a pause, while his audience thought hard. Not knowing their man, eventually they "bought" it, and asked the inevitable question. Without a smile, the reply came.

"Well, as I said, some of those shots were mighty long—so

long, that at times, when we got up to it, we found the meat had just gone bad."

When this eventually sank in, they departed silently, and never spoke to him again.

The old man's hobbies, in any spare time he had, were vegetable gardening and cooking. Although he never seemed to eat himself, he was a first-class cook, and when the fancy struck him he would produce special dishes and bring them over to the camp, often when a party of visitors had been to call on him down on the works. One day, after complimenting him on something particularly good, someone asked him where he had acquired this knowledge, so wasted in the wilderness.

"No, sir," he said, "I never learned to cook. It's my hobby, and I would not lay my hand down to any woman as to engineering a hash or building a cake."

His vegetable garden was a godsend, as apart from this, there were no vegetables to be had in the district. Gardening was not easy in the black cotton-soil, so he made his patch by digging out trenches in the hard, baked clay, and filling them with good soil brought from forty miles away. It had also to be fenced, to keep out marauding hippo from the neighbouring river. Buck were other would-be visitors who had to be discouraged. Unfortunately on one occasion an exceptionally high spring tide overflowed the banks of the river, flooding his garden with salt water and destroying the contents, so the whole thing had to be done over again with fresh earth from up-country.

As in the neighbourhood of all rivers which are apt to overflow their banks, there was only a small space of ground slightly higher than the surrounding country which was suitable for camping. In this cramped space were the wood-and-iron shack that did duty as station and telegraph office, sidings for stores, the bridge-material yard, and camps for the workers of various nationalities, including the Chinese carpenters. All these were close to the river bank, which on that side was steep and eroded. There were hippo and crocodile in plenty in the river, and though the hippo were usually in transit only, one had held up native canoe traffic on the water for several

days, and had had to be shot. Another wandering hippo must have taken a dislike to the remains of an old wood-covered wagon, derelict from the days of the 2' gauge railway, which stood abandoned on the plain. Driven through its woodwork, and broken off short, was the tusk of what must have been a very large and powerful bull.

The crocodiles used to lie out on the sandbank and bask in the sun at low tide. They were shy, and for that reason not an easy shot, especially with the width of the river between us, but occasionally there was a chance of execution. Once a hippo was shot by a hunter up-river, carried downstream by the current, and eventually stranded on the sandbank in a couple of feet of water. Its attendant crocodiles evidently had not been able to puncture the stomach, though the extremities had been well gnawed on the way down. Now they lay off in the deeper water, waiting for the inflated body to float again, in the meantime leaving the shallows to a mass of barbels and other fish who seethed around the carcase.

This seemed too good a chance to miss. I took up my position in the middle of the bridge, sitting on the open sleepers all ready to take toll. The hippo floated into mid-stream once more, the crocodiles following its course in close formation on the surface of the water some twenty feet below me. It might have been the illustration for a text book entitled *Crocodile Shooting for Beginners*.

As each one passed beneath the bridge, he got it in the most vital spot—the back of the neck. The scene was gruesome and might have come from some appalling nether-world—the huge, scaly forms lashing and writhing in a tangle of blood and foam. But in the days to come, nature had her revenge. The hippo returned at full tide, and what was left of one leg caught in the bracing of one of the bridge piers. When the tide slackened, the mutilated body was left suspended, to be joined later by the corpses of several crocodiles. These did not damage the bracing to the same extent, and were more easily disposed of than the wretched hippo. But as the wind blew from that direction on to my camp, I had a

memory of the dead which could neither be cherished nor forgotten.

Many other assorted scents floated over my camp when the wind set in my direction from the river. The Chinese excelled in routing out the most evil-smelling foodstuffs from the surrounding animal world, and of these I awarded the palm to the mud-turtle, which appeared to form their staple diet. There was no chance of shifting camp in the limited space available, so eventually I became quite an authority on Chinese ingredients. In collaboration with the natives, they even took possession finally of the travelling hippo. By that time, its meat was green, but still appreciated, as the hippo is one of the few animals which carry fat. The bouquet by now was really wicked, and I would not allow it anywhere within range.

Hippo meat is very coarse grained, like a cross between beef and pork, and is not popular as a food for white men, but I have seen the natives trade a whole leg of fresh buck for a small piece of decayed hippo meat that even the dogs shied at. The fat when rendered down makes extremely good cooking fat, equal to lard, and frequently this was the only fat available.

The natives in those parts had a curious belief that if the tail of a hippo was not cut off and buried, the meat of the animal would make them ill. The tail is like a small semi-circular rudder, very inconspicuous, with a few bristles on it, like a badly worn scrubbing-brush. Out of curiosity, I used to ask some of my friends in shooting parties if they had got a hippo's tail. They invariably replied that they had never noticed one—in every case the natives had obeyed their superstition, cutting off the tail immediately and burying it. The results of neglecting this precaution would be hard to determine, as, tail or no tail, the boys were generally as near ill as they could be from gorging the raw meat. They started on the feast as soon as they began to cut up the animal. The rite of carving up any large animal such as elephant, hippo, or rhinoceros, is the same among Africans all over Africa—blood, filth, and endless squabbling and fight-

ing over tit-bits, the whole performance unpleasantly reminiscent of a vultures' banquet.

Although there were many crocodiles in the river, some of them very large, they did not seem to concern themselves with the activities of our diver, who was working under water for several weeks on the bracing of the new piers. At first he was a little nervous when he saw the scaly bodies lying on the sand-banks across the river, so to ease his mind I fired charges of dynamite under the surface both above and below the works, every time he went down. The natives on the work were most intrigued by the diver when he first came on the job, and were sure the crocodiles would get him. When they observed his immunity, they tried to take advantage of it, and suggested he might take a gun down with him when the works were over, to bag some hippo for them. In a fit of curiosity one day, I went down in his suit, but got the life-line mixed up with the piles of the piers, and did not care to repeat the experiment. It considerably increased my respect for the members of this hardy profession.

The works were completed as the rains began at the end of 1903, but they had still to pass the test of the next floods, due early in the following year. So far everything had been successful, and there had been very little sickness. We had had no malaria, and only a few cases of dysentery, probably caused by drinking the local swamp waters. With so many working in a district of such ill repute, the medical authorities found us of great interest, in view of the work of mosquito research then engaged in by Manson and Ross.

So as to be on hand for the maintenance of the new works through their first wet season, I was given charge of the hundred-mile section north from Beira which included our recent sphere of operations. My headquarters were in Beira itself, and I accordingly moved down there, finding additional work in the construction of a lighter wharf (where I used my capable Chinese gang) as well as the reconstruction of the screw-pile pier which was serving as a lighter wharf in main river.

The rains in the following March were exceptionally heavy.

Added to the normal weather conditions, there was a cyclone in the Moçambique channel, the southern sweep of which struck Beira. The storm damaged the town considerably. Over ten inches of rain fell in one day, coinciding with the equinoctial spring tides and the Pungwe River floods from up-country. Everything was under water, including the station yard. There were serious washaways in the sandy stretch between Beira and Fontesvilla, and in one place the bank gave way as the mail train, which ran at night, was passing over it. The train was completely derailed, and part of it landed on its side with consequent serious damage.

Further on, however, the new works stood the strain and continued to do so for nearly thirty years, when they were badly damaged by the floods of another exceptionally wet season. As the line was now the main line to Rhodesia, the interruption of traffic was considerably more costly and inconvenient. The whole flats section was therefore deviated and the bridge located in its present-day position, all at a cost nearly ten times as great as that of the old works in the early part of the century.

In a new country there is frequently an increase in the volume and current of floods after some years, and the original bridges and openings which were quite adequate in the early days of a pioneer line have to be superseded. This is not necessarily due to an alteration in the rainfall, but rather to the clearing of forests and alleys for cultivation. There is a far quicker run-off and consequently far heavier and faster flooding.

With the end of the rains in 1904, I had been out in Africa for six years without going home. Now that the more interesting work on the construction of the line between Beira and Salisbury was finished, and there was only the office work of maintenance ahead, I asked for leave. I looked forward immensely to a holiday in England, but like many others without close ties, and after such a long absence during the formative years of life, I found many disappointments. Friends of earlier years had gone, or had developed other interests. After my life of strenuous effort and continual isolation, I

found it difficult to make new acquaintances, although I met with kindness everywhere. In addition, I had been infected with the curse of Africa—the curse of restlessness. I never properly recovered from it, and to a greater or lesser degree it has had me in its grip for the rest of my life.

After a few months of idleness, I heard that Sir Charles Metcalfe was on his way home. I went down to Southampton to meet his boat. He sympathised with my problems and misgivings in such a practical way, that a short while later I was on my way out again to join the construction staff of the Rhodesian Railways.

CHAPTER VI

THE RHODESIA RAILWAYS

ALTHOUGH by 1890 the rails from Cape Town had reached a point at Vryburg, 774 miles inland, this was primarily to serve the interests of Cape Colony and the territory to the north-east of it.

The master mind of Cecil Rhodes had dreamed of a railway stretching from the Cape to Cairo, for the development of all those countries through which it passed. When a railway from South Africa direct to the north became an absolute necessity in the last decade of the nineteenth century, Rhodes saw in this the possible starting point for his bold project. Had he lived, his dream might have gone further towards realisation. As it was, the northward scheme was confined to the almost untouched territory later to be called Rhodesia. Its inception was therefore linked with that of the Rhodesia Railways, and the history of these railways is to a large extent the history of the country itself.

Before the charter was granted to the British South Africa Company to operate in Lobengula's country, Rhodes had already obtained certain rights over the land lying to the north of Kimberley, then the terminus of the Cape railway system. Matabeleland was occupied in 1893, and in this year the railways extended as far as Vryburg on the one hand, and the seaboard at Beira on the other. By October 1894 the 3' 6" gauge line reached from Vryburg to Mafeking.

Cecil Rhodes recognised from the first the necessity of rail communications for the new colony he was founding. It was evident that an eventual connection with the Cape system was essential for the development of the hinterland of Southern and Northern Rhodesia. Several proposals were made to connect Bulawayo with Mafeking by a light railway, but it was not until 1896, after the Matabele Rebellion and the great

runderpest outbreak, when the shortage of cattle had put the freight charges up to £200 a ton over the 600 miles between the two towns, that the project became of vital urgency. Rhodes therefore sanctioned the construction of the line, which was completed within a year by the great efforts of Mr. George Pauling, the contractor who did so much for railway development in South Africa, and it was opened to traffic in November 1897.

Rhodes was now completely convinced of the importance of a railway in the development and expansion of new territories. From then onwards he devoted all his great energy and will power to the financing of railway construction to the north. Although the Cape-to-Cairo scheme never materialised in its entirety, the next forty years saw the spread of a web of "pioneer railways" which penetrated the whole of the sub-continent from Vryburg in the south to Beira in the east, the Congo in the north, and Lobito in the west, deriving its impetus largely from the inspiration of this greatest of Empire-builders.

Another project of Rhodes was a transcontinental telegraph, planned to extend from Cape Town to Alexandria. In connection with this, and the Cape-to-Cairo Railway scheme, he interviewed King Leopold II in Brussels at the beginning of 1899 with a view to concessions in the Belgian Congo, but could come to no agreement with him. King Leopold's terms were impossible. In March of that year, Rhodes had several interviews with the Kaiser in Berlin, and it was agreed that the transcontinental telegraph should be allowed to pass through German East Africa from the northern border of North-East Rhodesia to Nairobi in British East Africa. Permission was also granted to construct a continuation of the Cape-to-Cairo railway through German territory, and the permanent-way material for this line was to be carried over a proposed German line inland from Dar-es-Salaam.

The German group had planned to run their main line from Dar-es-Salaam to the north-east corner of Lake Nyasa, but it was pointed out to them that a line from Dar-es-

"The larder at Fontesville was always well stocked with a wide range of meat . . ."

Wart-hogs fighting, Serengeti, Tanganyika.

Hippopotamus, Lake Edward, Uganda.

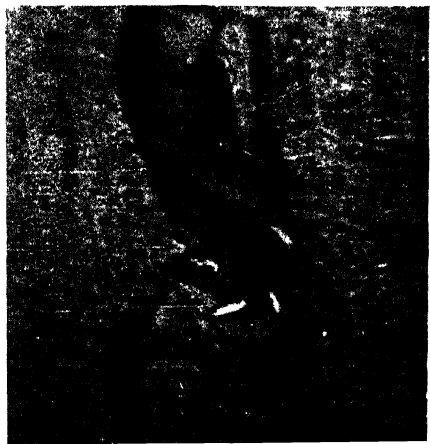




Photo by Celia Salmon

-up of rare white rhinoceros, showing square lip of species. West Nile, Uganda.



oing crocodile eggs; note young crocodile in man's hand. Lake Victoria, Uganda.

Salaam through Tabora to Ujiji, half-way up the eastern shore of Lake Tanganyika, would be far more advantageous. This suggestion was finally adopted, and the original intention was that this should form one of the feeders to the main trunk route. This railway, of metre gauge, 778 miles in length from Dar-es-Salaam to Kigoma, near Ujiji, was finally opened to traffic in February 1914, after an expenditure of nearly seven millions.

Another intended feeder to the main line was the metre-gauge railway constructed through the territories of British East Africa, which had been retrieved from possible German occupation by the efforts of Sir William Mackinnon and others, and taken over by the British Government in 1895. This railway was completed in 1902 and ran from the coast at Mombasa, past Nairobi, to the shores of Lake Victoria, a distance of 587 miles. There was a certain lack of foresight in the adoption of the metre gauge for the two East African lines, as, with the exception of the Egyptian Railways, which used the 4' 8½" gauge of Europe, all other railways in Africa are 3' 6" gauge.

The "pioneer railways" developed their own type of light construction, adapted to meet the conditions of the country, and to suit the exigencies of available finance. In the absence of any other means of transport for materials ahead, they were wholly dependent on their own ability to bring materials up from the base, as the rails were pushed forward. All bridges and openings were of a temporary nature, to be replaced by more permanent constructions at a later date. It was essential to make the maximum progress at the lowest capital cost, with refinements to follow when justified by sufficient revenue.

The prime factor in this type of construction was therefore efficient feeding from the rear. For that reason, the location of the railway followed the line of least resistance. Wherever possible the lines were located along the watersheds, avoiding river crossings; at the same time, the grading of earthworks was reduced to a minimum. The country traversed along the Central African plateau, though broken in parts, was on the

whole of an easy nature. In all the railways of South and Central Africa, the most difficult country was the approach to the plateau from the coastal termini, as from Beira on the east, or Lobito Bay on the west. On both these lines, heavy works were necessary on the ascent to the interior. Gradients and curvatures on the plateau were easy, but on the coastal approaches, much steeper gradients and sharper curvatures had to be adopted.

It is sometimes too readily forgotten that these pioneer railways were built under difficult conditions, where rapidity of progress was essential and finance was limited, and that the increase in revenue to meet improvements in alignment was frequently tardy. The history of all the financial undertakings involved in the construction of the Rhodesia Railways alone is a romance in itself, but is outside the scope of this sketch. The glamour, half romantic, half patriotic, of participating in the Cape-to-Cairo route, was undoubtedly a factor in assisting the financial promotion of the railways. Even so, the raising of funds was not always an easy matter, as we on the actual construction were forced to realise by the spasmodic delays, the sudden stopping and starting of the various works, and the number of different companies involved.

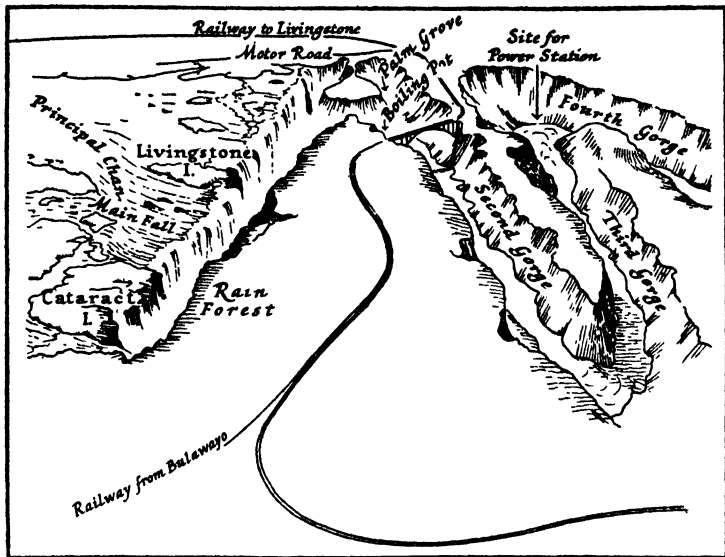
These pioneer railways, or lines of penetration, financed and built by private enterprise, cost on an average £4,000 a mile. On the way north they crossed vast stretches of empty country, from which no future return of revenue could possibly be foreseen. On the route from Cape-to-Cairo, more vast spaces would have to be traversed, equally profitless, and it soon became apparent that there was no economic justification for this romantic project. On financial grounds it had to be abandoned, although for strategic purposes it would have been invaluable during the last two great European wars, and would fully have justified its existence in the saving of lives and shipping.

It was originally intended to carry the main line of the Rhodesia Railways northwards from Bulawayo via Gwelo, to cross the Zambesi in the Mafungabusi district, and continue

by the most direct route to the southern end of Lake Tanganyika. Work upon the extension from Bulawayo to Gwelo was begun in June, 1899, but had to be suspended on the outbreak of the South African War in October of that year, owing to the impossibility of bringing permanent-way material and stores from the south. It was accordingly decided to utilise the eastern route and extend the line from Salisbury to meet the main line coming up from Mafeking. Connection was made at a point fifty miles east of Bulawayo on the 6th October, 1902. Meanwhile, further exploration indicated that the proposed route via Mafungabusi would entail a very difficult and expensive construction. Moreover, important and extensive coal deposits were discovered in the neighbourhood of Wankie, while the Victoria Falls lay a little further to the north. These considerations led to the adoption of another route for the main line via Wankie and the Victoria Falls. Wankie was reached in September 1903, and the Falls on 25th April, 1904.

The Victoria Falls Bridge, apart from being one of the highest, is probably one of the best-known bridges in the world—not on account of its span, which is comparatively small, but because of its romantic and beautiful setting, known to visitors from all over the world.

The choice of its site was more for sentiment than for practical reasons. It was Cecil Rhodes's especial wish that when the bridge was crossed on the Cape-to-Cairo route, the passengers should be close enough to feel the spray from the Falls—and at certain seasons of the year this is possible, and his wish is fulfilled. This of course entailed a special type of bridge, fortunately designed to blend perfectly with the surrounding scenery. A simpler crossing of the river could have been achieved six miles further up above Kandahar Island, where the longest span of the group need only have been 150 feet. In its present position, however, the bridge enables visitors to watch the whole wonderful grandeur of the Falls from various aspects never otherwise revealed, in a far shorter time: before it was built, it took the greater part of a day to view the Falls, first crossing upstream by canoe, and then



embarking on a lengthy walk down the other side of the river, no other means of transport being available.

With the arrival of the railhead at the Victoria Falls in April, preparations were immediately put in hand for the camps and yards required for the construction of the bridge. Next and most important was the making of a contact between the two sides of the gorge near the bridge site itself.

At that time the only possible point of transit across the gorge was at Giese's Drift, just above the Devil's Cataract on the south side of the river. From this point a canoe could cross to Maramba Drift on the northern bank, then travel down to the bridge site, a distance of three miles or more. We first tried to make contact with the other side of the gorge by means of a kite, but this was unsuccessful. We eventually made the connection with a rocket and a light line; a heavier line then followed, and finally a steel rope. The position of this was downstream, a few yards from the bridge site. A wooden box, five feet cubed, was slung on two steel sheaves from the steel rope, and drawn by a light steel wire from

each end by a windlass operated by natives. It was a primitive mode of transport. The supporting wire sagged ominously in the middle of the gorge, and if one disliked heights, there was plenty of time to brood in transit as the flimsy box jerked its way across. This little carrier served its purpose well throughout the construction of the bridge. It was used for all small loads, tools, and occasionally for personnel, while the Blondin dealt with the heavier work.

The Blondin was an interesting feature, thus christened for reasons which will soon become apparent. It was situated on the upstream side, on a slight angle, away from the centre line of the bridge itself, being used solely for transport of materials, and not in the actual construction. A steel tower, 30 feet in height, was erected on the northern edge of the gorge, and over this a 4-inch-diameter steel cable was carried, and anchored in the rock beyond. The cable had a span of 1,000 feet. It was made fast on the south bank to the apex of a triangle of steel sheerlegs, which stood at a flat angle away from the span, their base in hinged sockets that took up the thrust. Where the cable ended at this apex, there was a sling supporting eighty to a hundred tons of rails as a counterweight; this allowed the main cable to remain flexible, the weighted sling rising and falling as compensation for the varying weights carried across the gorge. The name "Blondin" was really applied to the overhead carrier, which consisted of two four-foot wheels, grooved to ride on the four-inch cable and lined with hardwood so as not to wear it. One of our principal delays in the work of transport was caused by the necessity of constantly re-lining these wheels. The Blondin carried an electrically-driven winch to power its haulage both ways. Below were treble steel sheaves, the lower one carrying a chain-sling and hook; these were raised or lowered by a steel rope operated on the winch near the driver's most precarious-looking seat.

Electric power was derived from a steam-driven plant near the yard on the south bank, where all the bridge material was stored.

The driver of the Blondin, who worked it throughout the

The first call on the Blondin was of course the transport of bridge material, the heaviest sections being the lower boom members of the main arch, which were 27' 8" in length, and 6½ tons in weight. At other times it was used for transporting every type of material for the main line, which was proceeding slowly towards the new Maramba depot in process of establishment by Paulings five miles beyond the bridge at the site of the present station of Livingstone. Rails, steel sleepers, rolling stock and all possible stores and materials were carried across the gorge by the Blondin, mostly in loads of five tons each.

The foundations of the bridge on the northern side of the gorge gave very little trouble. By September, they were completed, together with the impost, or upright at the end of the arch, 105 feet in height. The connecting land-span of 66 feet was also completed then. The foundations at the southern end presented more of a problem, as suitable live rock was not reached at the originally anticipated depth. Owing to this, it was decided to lower the whole structure, which would otherwise have been more on a level with the lip of the Falls themselves. As it is, the bridge is well below. All materials for the foundations had to be lowered from the Blondin at both ends. A steel bucket, four feet in diameter and four feet deep, carried all materials such as sand, cement and water.

Visiting that part of the work was another unpleasant little trip. By the time the bucket was lowered to the requisite depth, on some 150 feet of single rope, it had an unsettling trick of revolving violently one way, then stopping, and revolving with equal violence in the opposite direction.

The system of suspension of the steelwork as it extended from each side until the lower boom was joined, was achieved by means of twelve 1¼-inch steel hawsers. These were made fast to a steel pin six inches in diameter at the top of each side of the impost, and adjusted with union screws. From the pins they were led back level until clear of the bridge, then down a vertical shaft through the live rock, tunnelled across, and led up another shaft on the other side to form a similar

"It was Cecil Rhodes's especial wish that when the bridge was crossed on the Cape-to-Cairo route, the passengers would be close enough to feel the spray from the Falls . . . the bridge enables visitors to watch the whole wonderful grandeur of the Falls from various aspects . . ."





connection on the other side of the impost. The thrust of the arch on the lower end of the imposts was taken up on a twelve-inch steel hinged bearing, which in turn was set in a block of strongly reinforced concrete. This type of construction was also used by Sir Ralph Freeman, only in a far more elaborate manner, in the design of the Sydney Bridge.

The actual handling of the steelwork erection was by means of electrical cranes set on each side of a square framing. These were moved forward as each bay of twenty-five feet was completed.

There was no hitch in the work, which went forward smoothly. There were no serious casualties, and only one death by accident throughout the whole period, when an African's legs were sheared off as the cross girder of the bearer of the top of the northern impost was being lowered into position. A net was spread below the works across the central part of the gorge, but luckily this was never needed.

By the end of March, the steelwork erection was sufficiently advanced for the linking up of the lower boom of the arch. At that time of year the spray of the Falls nearby is almost at its greatest intensity, and caused great discomfort to everyone employed on the works, particularly those on the south approach. The linking-up was fixed for 6 a.m., before sunrise on the 1st April, 1905. Imbault, the contractor's agent for the erection, had made his calculations to allow for the presence of spray on the steelwork as usual. Hand winches were rigged with steel ropes made fast around the two groups of twelve $1\frac{1}{4}$ -inch steel cables which were holding up the whole side of the northern part of the structure. In the event of any minor defect in the alignment in closing, a slight pressure from these on either side would swing and adjust the centre 250 feet away. During the erection, allowance had been made for adjusting the supporting steel cables in order to lower the structure into its final position.

All were assembled at dawn. Connecting plates were in position, and on each side of the lower booms men stood by with drifts and service bolts ready to catch the rivet holes as they coincided and came into position. For some un-

accountable reason on that morning and at that hour, the wind changed. The usual spray failed to fall on the bridge, with the consequence that the steelwork was dry and ready to absorb the heat, which might spoil the chance of a junction being effected that day.

The sun rose, and started to warm one side of the steelwork, which immediately began to expand, while the gap closed perceptibly from the expansion, the warm side faster than the cooler one. There was an anxious few minutes as we wondered whether the action of the winches on the steel cables would be in time to sway the whole body of the steelwork into the direct alignment before the fast-closing gap could forestall it. Then, slowly, with the action of expansion closing, and the winches swinging the joint laterally, they coincided to make a perfect butt joint. As soon as the rivet holes of the cover plate, some four feet square, and those of the boom coincided, drifts were immediately driven and service bolts made the joint fast, very much to the relief of all concerned. The main part of the work was now done, and the anxious part of it, and from now on it was plain sailing, with riveting continuing in full swing from both ends.

From the time the work first started, we had an interested group of spectators watching every detail. This little party consisted of the chief of the Batoka tribe and his head men, who lived some miles away on the north bank. The old man took a keen interest in everything. From one who knew his dialect, I gathered that his impressions and opinions were something like this:

“Of course the white men are very clever, and can do most things, but as soon as all this zimbe [iron] gets further from the bank it will of course fall down the gorge.” With wonder he watched the progress until the two sides were finally linked up, but still refused to relinquish his theory. “Now with great luck, they have got this thing across, the trouble will be when they try to put a train on it, which they evidently mean to do. What they should do to save it all would be to put a stick up from the bottom to hold it up, certainly it would have

to be a long stick, but as they have got the bridge across, they should be able to do that as well, but it is not for me to tell them; I am an old man, and I know these things. . . .”

When the upper boom was connected up, a temporary track was laid on the open steelwork, and a lightly-loaded truck run over as a trial trip. The old man and his council came down to see his prophecies fulfilled, and anxiously they all waited as the shunting engine slowly propelled the first two trucks across. It is not known how the disappointed prophet explained our success and saved face over his own failure as a foreteller of disaster.

No permanent riveting had yet been started, and the whole framework was connected with service bolts, which were removed later as the riveting proceeded. The temporary track was strengthened for light traffic, and alongside was laid a footway eight feet in width, made of loose timbers laid on the open steelwork, leaving the rest open to the gorge below. Light traffic was then introduced, and was operated at night, starting in the evening as soon as the bridge-hands had knocked off for the day. Sidings for this traffic were laid either side of the line several hundred yards from each end of the bridge. The maximum load at first was two loaded trucks, and a light shunting engine, the same *Jack Tar* which had rendered such good service on the Beira and Mashonaland Railways during the South African War. This traffic enabled the line ahead to be laid at a greater rate, although some 50 miles had already been completed with material transported over the gorge by the Blondin.

On one of the first evenings after the opening of the line, the guard noticed something in the narrow cutting alongside—but as it was on a sharp curve he could not see exactly what it was, and thought no more about it. On the next trip across, the low side-rod of the engine smashed the head of a leopard that was crouching on the plank footway of the bridge. This leopard was evidently one which had been giving trouble recently at the camps near the Palm Grove, and must have been frightened in the cutting. It probably followed the cutting for a certain distance until it was well on to the bridge,

and was then unable either to go forward or to return. One of my dogs reacted in this way when trying to follow me across. She just lay down, and eventually had to be carried. It was lucky that the leopard was not on the track itself, as derailments on other parts of the line had been caused through animals very little bigger. The countless baboons and monkeys everywhere in the gorges made them great hunting-grounds for leopards. One man who was resident at the Falls for some years trapped over fifty of them south of the river during the time he lived there.

After a month on the bridge works, I was detailed as District Engineer to go forward with the construction work that had been started to the north. I accordingly made my camp near the spot chosen by the contractors, Pauling & Co., for their depot. The rails had not yet reached the site, which was on the flat ground surrounding the present Livingstone Station. I camped on the hill just beyond the present township of Livingstone. Several months later, when the Government Surveyor came to lay out the township, I shifted down to the flat near the contractors' depot.

At that time the territory north of the Zambesi was a part of Barotseland, and being a Protectorate was not yet open for European settlement. Kalomo was the headquarters of the Administration, with Mr. Robert Coryndon, afterwards Sir Robert Coryndon, as Administrator. He was assisted by about half a dozen young officials sent up by Cecil Rhodes in the late nineties, and there were also about the same number of white officers forming the Barotseland Police, under Major Harding. Apart from a few missionaries in the west, and a handful of prospectors, these constituted the entire white population of the country when the railway first entered it. Further to the west, at Lealui on the Zambesi River, was the seat of the paramount chief Lewanika, and to the south, also on the Zambesi, resided his sister, a woman of large proportions and of considerable influence in Barotseland. Several young officials had recently been sent from Fort Jameson, then the capital of North-East Rhodesia, to occupy the part of this territory north of the Kafue River. All this new

country was shortly afterwards to be combined under the name of Northern Rhodesia.

Several Europeans were then engaged in the development of the Broken Hill Mine, of which at that time much was expected, although so little materialised. This was to be the next objective of the line to the North. There were also the prospecting parties under George Grey, sent out by Robert Williams of the Tanganyika Concessions. These were active further north, both in Rhodesia and the Katanga, the frontiers of which, except for their location on the Congo-Zambesi watershed, had not yet been defined. With the exception of this small, scattered handful of white men, the whole vast area was unoccupied, and remained so until after the line reached Broken Hill, 374 miles north of the Falls, in January 1906. The pioneer railways therefore fulfilled their purpose of penetrating the new countries prior to their development and settlement.

The progress of the construction of the 94 miles to Kalomo was naturally slow, as all materials after crossing the gorge either by Blondin or in light loads across the temporary line on the unfinished bridge, had then to be off-loaded, sorted, and re-loaded for transport ahead. This work, together with the re-erection of engines and rolling stock, was done at Paulings' depot at Maramba, five miles north of the river; so there was considerable delay, principally at the river-crossing itself, where transport could only be utilised when it did not interfere with work on the bridge. In spite of this, the line to Kalomo was laid before the first full train crossed over the permanent bridge.

During the construction of the first section of the line beyond the Falls, preparations were made for a celebration of the completion of the bridge. The programme consisted of a one-day regatta, a day's racing, and a day of athletic sports, for all of which courses had to be arranged. The celebration was a great success, especially the regatta. The course for this was a mile-and-a-half in length, on a straight reach of the river between Luanda Island and the left bank. While the bridge works were in progress, Mr. Everard,

assistant-engineer on the Rhodesia Railways, and I were detailed to begin a preliminary survey for a power scheme of the Falls, the initial work of which took us along the left bank five miles upstream to Secuti's Drift. This was the site of Old Livingstone, before it was shifted five miles further inland to its present site near the railway. With the experience thus gained, we were able to set out the regatta course, as well as a continuous path along the river's edge for the use of trainers of the various crews.

A mile-and-a-half of railway was built from the Maramba depot to the river, to take the boats to the water, and carry spectators to the different sports-courses, which adjoined the finishing post of the regatta course. Part of the race-course was used for the sports meeting. A camp site was also prepared for the visiting crews. Three weeks before the date set for the regatta, crews and their boats arrived from Cape Town, Port Elizabeth, East London and Durban, and went into training.

Meanwhile, Sir Charles Metcalfe had sent to Oxford for four clinker-built fours, for the Rhodesian Championship, but we were only able to raise three crews: North Rhodesia, consisting of Government officials and Barotseland Police from Kalomo; Livingstone, mostly members of Paulings' staff; and Kafue, who were all construction staff, engineers, contractors and bridge, and none of whom had yet seen the Kafue River.

The South African crews were naturally in a class of their own, so there were two major races, one for them, and one for the Rhodesians. Marsland and I, with Cumberpatch and Micklem as stroke in the Kafue boat, were all more or less lightweights, and won the Rhodesian race by a length. The Kalomo boat carried sixty-four stone with their cox, and included such giants as O'Sullivan of the Police, Skipper Swanston, and others of the same stamp. Of course, they hadn't a chance. After paddling up a mile-and-a-half on a hot afternoon, there was a delay at 2 o'clock owing to some fault in the steam-launch that carried the umpire, Mr. Marshall Hole. By this time their boat, the *Bleeding Heart*,

which had shown very little freeboard throughout, appeared to be definitely sinking. They managed to get home before it foundered, however, and carried the much-tried craft up to the boathouse, to the strains of the *Dead March*.

The Barotse, competing in their light dugout racing-canoes, provided much interest and excitement for the spectators. They had come down in great force from the upper reaches of the river, even from as far as Lealui. As there was great rivalry between the various crews, their races were keenly contested and roused terrific enthusiasm among their tribesmen ashore, which was expressed in the customary uninhibited manner of the African.

In those days the hotel at the Falls was a small galvanised affair, quite incapable of dealing with the situation, so the hundreds of visitors from all parts of South Africa were housed in trains on the nearby sidings. A disused engine-shed, brought up from Mafeking, was suitably decorated and transformed into a dining-room. It served as such for many years, until the present palatial building was erected.

The whole celebration was perfectly organised, and everyone assisted in whatever capacity he could. On the other side of the river, where the various crews had been camped during the preceding three weeks, the last night was a memorable one. It was bright moonlight, and huge camp fires burnt bright against the dark background of the forest and waterway beyond. After the regatta, all training suspended, eighty of us, from all parts of South Africa and Rhodesia, sat down at one long table with Robert Coryndon, the Administrator, at the head. A good time was had by all, continuing through most of the night—and so ended the first regatta on the Zambesi River. The same course was used again several years later for the world's sculling championship.

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The rails reached Kalomo, the end of the first contract of 94 miles from the Falls, in July 1905. Then there was a hiatus. It seemed that we should stop there, on account of a financial hitch, and we were all given provisional notice, but

it did not last for long. With the completion of the first contract, a new contract had been arranged to our next objective, the recently-developed mine at Broken Hill. This supposed Golconda was expected to justify a train a day by the time the rails reached it, but it was a very different proposition when they did. Whether for want of proper development, or for lack of adequate machinery, the mine remained a great disappointment to its backers. On the other hand, it certainly served as a lure for the next link in the line to the north.

At about this time, there were a number of changes in personnel, both on the engineering and the contractors' staff.

Mr. Townsend still remained as Chief Resident Engineer of the Rhodesia Railways, with headquarters at Bulawayo. Mr. Tower left on the completion of the Falls bridge, and went down to Johannesburg to take charge of various new construction works in progress there, under the Cape Government Railways. I succeeded him on the works from Kalomo to Broken Hill, and was Resident Engineer for the Kafue River Bridge. Mr. Harold Pauling, who had been Chief Agent for Messrs. Paulings' for so many years since the beginning of the Rhodesia Railways, had died. Mr. A. L. Lawley, the director of Paulings' who had given me my first chance in the Beira and Mashonaland Railways, now came to Maramba as Resident Director and Agent for Paulings' on the works ahead. With him were Messrs. Hicks and C. Buchan, who left when the line neared Kalomo.

Mr. E. R. Marsland was my opposite number for Paulings' on field-works during the mile-a-day contract from Kalomo to Broken Hill—281 miles in 277 working days, truly a young man's job. He was then twenty-six years old, and I was twenty-nine. Our only transport on the works, apart from that on the line, was a cart with six mules, and two ponies apiece. Those were the days before motors—which would have served us so much better. We lost a number of animals in the tsetse fly belt, which started 25 miles north of the Falls, and was 20 miles wide. There were no other





“The Mashukulumbwe are a tribe of their own, and do not resemble any of the surrounding Bantu . . . They went stark naked and wore a head-dress three or more feet high.”

fly belts on the route of the line until immediately north of Broken Hill, and we did not encounter these until a later contract.

As tsetse fly are not active during the night, our mule transport was rushed through the hours of darkness. Notice boards were erected at the outspans, five miles clear of the belt, on either side of it, so that there could be no mistake. For use on the work, which naturally had to be carried on during the day, Paulings' kept two ponies and I kept one, at either end. All of them succumbed eventually, except for one of mine. Although he was thin, and useless as a ride, he seemed to enjoy life, and I had not the heart to destroy him.

He eventually repaid my kindness, while running with the mules and other animals, by kicking and killing the greatly-prized wheeler of the cart-team I had taken over when I joined the railway construction. He knew all about lions, and when we were outspanned, no riem could hold him if there were lions about. I left him running wild at the Falls when I went south to Bulawayo in 1906.

The contract for construction of the line to Broken Hill at the rate of a mile a day was in its stride right from the start. The route lay across the Batoka Plateau, on which the earth-works were light, with only surface openings, and no appreciable waterways or bridgework until the line reached a point some forty miles south of the Kafue River. In this section there are four bridges of 100 feet over the rivers draining into the Kafue itself, and several lesser ones.

The survey party under P. St. G. Mansergh had already made the preliminary survey as far as Broken Hill, and were back to the south of the Kafue on the final alignment. It was arranged that Mr. Lawley and I should overtake or meet them at the Kafue, to discuss and decide the length of the bridge required over the river. By a curious coincidence, the mileage of the bridge from Cape Town bore the same number as the year in which it was built.

There was only one wagon-road north from Kalomo to Broken Hill. This road crossed the Kafue at M'Kala, about

200 miles by river to the west of the railway crossing, so with the exception of the track cut by the survey party for their wagon, there was no road following the railway, and the survey track was very sketchy in places. As Lawley did not want to be away for long, and I wanted to shift my camp from Maramba to Kafue, we did not waste any time. Lawley at the time was a sick man, though his boundless energy kept him going; he also had the superstitious belief that it would be unlucky to turn back. The new buckboard he had recently imported from America started to break up under the strain, and it was a marvel how his Dutch driver kept it going, bound up with bush timber and rawhide riems. My Cape cart, which had stood the strain of many years already, bore a double load for most of the time, while the forced pace of our trek was very hard on the mules and ponies. It was during the dry season, and they were dependent mostly on the scanty grass picked up along the route when out-spanned; there was not much grain to be traded along the way.

The survey party had warned us to look out for the Mashukulumbwe tribe when we approached their territory, as they were apt to be truculent, and had announced their intention of killing whom they could on the forthcoming construction, a threat they eventually carried out on a few of the boys belonging to the first earthworks sub-contractor on the south approach of the bridge.

The Mashukulumbwe are a tribe of their own, and do not resemble any of the surrounding Bantu. They are a tall, black-skinned race of Nilotic type. They went stark naked and wore a head-dress three or more feet high, like that of the Dinkas on the Nile, whom they resembled, not only in appearance but in habits as well. This type of head-dress could only be worn in their open swampy country, which also resembled the sudd country of the Dinkas. It was a work of art, the base being of their own hair, into which other hair was woven, tapering evenly to a fine point. The tip was made of a finely-scraped piece of lechwe horn, (lechwe being a local swamp antelope). When sleeping, this

fine end was fastened to a point on the wall of the hut, or bound along an assegai shaft.

They lived with their cattle on the islands and swampy margins of the river, which for two hundred miles to the west from the bridge, follows a tortuous course across flat country to form a spreading lagoon. Immediately below the bridge, to the east, it falls rapidly until it joins the Zambesi seventy miles beyond, passing through the Balengwe Gorge on its way. The dug-out canoes of the tribe were usually very light, and built in two parts. When a long craft was required, these were joined by lacing, while when used singly, the stern end of the canoe was blocked with a wall of clay. Their paddles, which they used from a standing position, were entirely different from those of the peoples on running rivers, such as the Barotse on the Zambesi, who use paddles made in one piece, narrow poles which can fend off the rocks. The Mashukulumbwe in their swampy waters used a paddle with a heart-shaped blade of hardwood, twelve inches by nine inches, carved on the face, and spliced to a long handle. These paddles certainly had a good grip on the water. When travelling with members of this tribe by canoe, I used these paddles as they did, but could never persuade them to part with one.

It was late in the afternoon when we crossed the Magoy River, and outspanned outside the kraal of Meninge, one of the outlying chiefs of the Mashukulumbwe, some distance from the Kafue. There were a number of natives about, but no one came near with the usual presents or offers to trade, and we wanted grain for the animals. I began to feel a little nervous. Not only had the survey party warned us, after passing there shortly before, but this was the same kraal where Selous some years ago had had the narrow escape mentioned in his book. On this occasion he was attacked by the tribe at night, as they prefer the darkness for fighting or raiding, and he escaped by the skin of his teeth in just a shirt, with one rifle and three cartridges. We had followed the same route as Selous on his return to the Zambesi, through the kraal of Monze, one of the chiefs of the Batoka country,

and so to Meninge's kraal near the Magoy, which was much as its description in the book, occupying the same site, and surrounded by fields of grain and groundnuts. The resemblance was too close for my liking, and I was not sorry when dawn came, and we inspanned and trekked on.

A couple of days later we caught up with the survey party, just south of the Kafue, and after discussing the various details of the future bridge, and eventually deciding on 13 spans of 100 feet, we started on the return trek. The one up had been strenuous for the animals, as we had averaged 35 miles a day for nearly 500 miles—pretty good going with the shortage of forage, over the track of a single wagon, almost invisible in places, and rough into the bargain. During our absence, the rails had been advancing over the easy going of the Batoka Plateau at the rate of several miles a day, so our return journey to the railhead was considerably lessened even in that short space of time.

As soon as possible after my return to Maramba, I collected stores and kit for my return by the same route to take up the duties of District Engineer for construction, and Resident Engineer on the Kafue River Bridge.

The field staff on construction usually housed themselves either in rondavels or grass huts according to the length of time they had to spend in any particular place; the survey party had tents. As a luxury, I had had a twelve feet square portable galvanised hut built in sections to take north with me. This was the first building of a semi-permanent nature to be erected north of the Kafue.

When all was ready, I set off with one ox-wagon of stores, another with the hut, my cart and six mules, and three ponies, one of which was the flystuck one already mentioned, who, although useless for riding purposes and as wild as a hawk, seemed to enjoy life in the company of the mules and the other ponies.

When we got past the foremost earthworks, and on to the survey wagon-track, the trouble started. The track cut through the bush was wide enough for a lightly-loaded wagon, but refused to accommodate the wagon carrying my hut,

which overlapped the buckboards by a few feet on either side. To avoid damaging the hut sections, I had virtually to cut a new track every time we ran into bush. This held us up considerably, and it took nearly three weeks to complete the journey of 250 miles. I had in charge of transport the South African, Geldenhuis, who had driven Lawley's cart on our previous trek. On our way down on that first trek, we had outspanned in one place on high ground overlooking the Kafue flats, with a magnificent view. At the time, we fired the long dry grass, so as to enable us to see the game on our return. When we outspanned here again, the plain was covered with fresh green grass. Next morning, when the sun rose, we saw every type of game in the country, grazing around us in company with our outspanned oxen, mules and ponies. As these animals had never been hunted or shot, they showed no signs of fear, even at close quarters. It was an unforgettable sight, one of those memories of untouched Africa that has lived in my mind even though in fifty years I have seen most of the enormous concentrations of game in all corners of the continent.

A few days later we reached the south bank of the Kafue. Geldenhuis returned south with the wagons. With the few personal boys I had brought with me, and some twenty naked Mashukulumbwe, whom I had persuaded to work on the promise of meat in plenty, I proceeded to get my things across the river in their dug-out canoes, and start a camp a mile from the water's edge, clear of the swamps, on a site which in later years was occupied by the hotel.

Although, owing to their reputation, I was still rather shy of the Mashukulumbwes, they turned out to be first-rate, as soon as they understood what was to be done. As I managed to keep my promise regarding the meat—there was plenty of game close at hand—they were well satisfied and cheerful. I made them camp and sleep about fifty yards in front of my small tent, so that with the flies open I could keep them in full view during the night. I also had two deer-hounds chained to the front pole of the tent. From my vantage point, they were a weird sight as they sat round their fires at

night, feasting and talking, with their naked bodies and three-foot head-dresses gleaming in the firelight.

The hut which I had gone to so much trouble to bring up with me was off-loaded and left on the south bank of the river. The sections were too awkward for loading in the light canoes, so with the help of my labour, several rondavels and reed huts were erected in the camp for living quarters and stores.

The camp was sited close to a gap in the hills near-by. The neighbouring game had never been disturbed, and it was like living in a menagerie without cages. When I shot meat for the camp, I took good care to collect it some way out on the plains. At night, hunting-animals such as lion, leopard, wild dog and hyena, came out through the gap in the hills, and spread themselves over the plains after their prey. At times, I used to write to *The Field*, describing the game in any new country I visited, if I thought it was of interest. I think that there was no part of Africa which had such a wide variety then as the Kafue district. I remember writing an article describing the different species to be found in a five-mile radius of the bridge site. The radius included hills, plains, and swamps. There were greater kudu in the hills, any amount of different kinds of antelope on the plains, and sitatunga, lechwe, and puku in the swamps to add to the list. It was curious that though there were any number of wildebeeste on the south bank of the river, there were none on the plains to the north.

All the carnivores were represented, and the hyenas were a positive nuisance. I had to take stringent steps to keep them out of the camp at night. They are uncanny, mangy animals, and though they do not usually move about in troupes, at one time I saw fifteen of them together. Whether it was the breeding season, or whether some other reason had brought them together I never discovered, but I came on an open patch of about half-an-acre where they evidently all met at night. The ground was literally white with their dried excreta, a sight I have never seen elsewhere.

At times they were bold enough to enter the camp and

take skins from the floors of the huts. My two Irish deerhounds, when not tied up, would course them; as far as I could tell, they never actually tackled them, but I could hear the loud snapping of jaws as they ran. Once when the dogs were made fast, a hyena took a dried skin from a hut, and the noise of the dogs brought my boys and myself out to see what it was all about. In the moonlight the skin was visible, lying at the edge of the camp-clearing. I told the boys to go and pick it up, but when they approached it, to our amusement the stiff dry hide started bounding over the burnt stubble. Evidently the hyena was beneath it, probably holding on to one of the shrivelled legs. A day or so later, I found it near an anthep, half-eaten.

Any leather, even harness, was attractive to them. When outspanning the mule team, it was usual to lay the breastplate, bridle and traces in line, ready for quick inspanning again. For a team of six mules, the array of harness would extend some distance from the cart. We usually slept under the cart, or alongside it when trekking, as on those occasions one never carried a tent, and in any case there was little time to erect one, apart from the lack of assistance. One night, when the hyenas were possibly attracted by the salt sweat on the leather, some of the leaders' harness was badly mauled before the driver or myself could retrieve it, and it was quite a business to sort it all out before it could be used for inspanning again. This, with other minor mishaps, was incidental to that type of trekking, but it was our fastest form of transport in those days. With a mile-a-day contract in progress, and short of staff as we were, life was spent mostly in the open, and it was essential to camp when the animals really had to rest. There is something to be said for the modern technique of being able to step on a self-starter and cover more miles in an hour than we could then achieve in a day—and a long day at that.

Another hyena incident was far more gruesome. One day an African died, and was buried a short distance away in the bush, unfortunately not deep enough. That night the dogs happened to be loose, and after the inevitable disturbance

they went off in full cry after the intruder, who in the course of the hunt dropped a leg of the corpse in the middle of the camp, where it lay abandoned in the bright moonlight. The boys would not touch it, and I must admit I was not keen on the idea myself. Inspiration suggested that the dogs should be tied up, and the camp kept quiet, and this proved successful. In the morning no trace was left of the night's escapade.

On another night, wild dogs ran a reed-buck to within a couple of yards of my hut, where it lay exhausted. My appearance on the scene and the baying of the dogs caused the pack to sheer off, and the buck, when sufficiently recovered, disappeared thankfully in another direction. With all these interruptions at night, I decided to put a reed fence round the camp, but unfortunately before I did so, I lost one of my dogs to the lions.

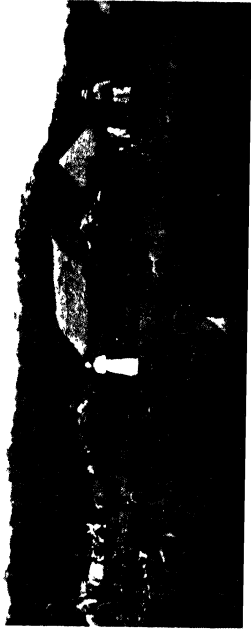
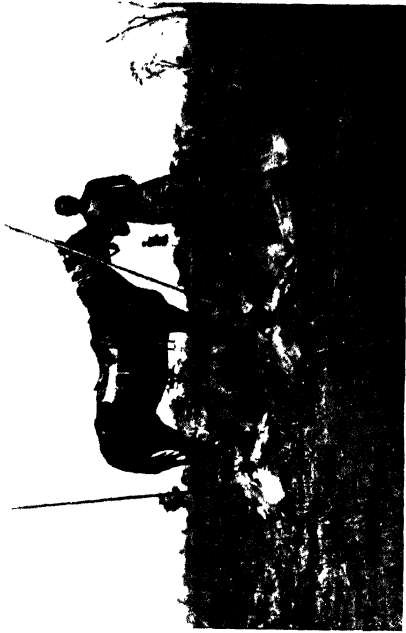
I had brought with me two large hunting-dogs, Sheila and Shane, who for most of their breeding were Irish deer-hounds. They were good friends to me, and invaluable when hunting meat, as they saved me a lot of time, which was an important factor. Shooting big game for sport at one's leisure is one thing, but having to provide meat for a large and hungry gang in the absence of other food, and when there is a great deal of other work to do, is quite another. Sheila and Shane were brother and sister, and I had managed to get them at the Falls from a man who had brought the father, a pure Irish deer-hound, out from England. The father died a tragic death just before I left. He tackled a big baboon, and as is the way of a dog with a baboon, he got hold of it by the stomach. In addition to its dangerous jaws, the baboon has four powerful paws with which it can literally flay both sides of an attacking animal. A dog has really very little chance once the baboon has brought its paws into play, and in this case they both died locked together.

Sheila's end was equally tragic. One night the dogs were loose, as I had forgotten to chain them as usual near my bed. I was woken by the grunting of lions close by, but was not in time to stop the dogs, who started out after them. I heard the fight, but it was too dark to see, let alone to shoot. The

brought with me two large hunting dogs, Sheila and
Shane”



Coryndon with the eldest son of Lewanika,
Harotoa during the first ranatta on the



RIVER BRIDGE

Mashukulumb-
we crossing
cattle.

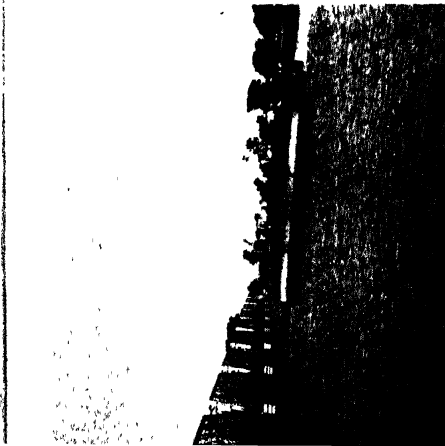


Loaded railway
wagons hauled
by oxen through
soft ground, be-
fore it was pos-
sible to cross
first engine.



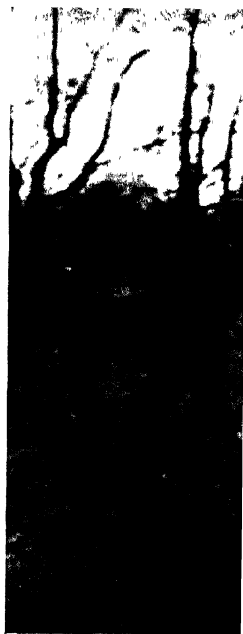
Completed
piers, ready for
construction.

"This pontoon was a great success. It was able to transport one engine . . . to launch and place in their permanent positions, three steel spans in one day."



" . . . fourteen hundred feet long, the longest in South Africa at that time . . . 100' spans designed and fabricated in England for erection *in situ*."

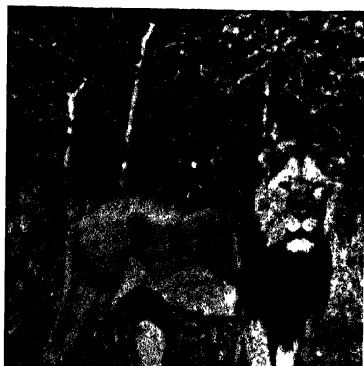




le Antelope bulls, normal species.
thern Rhodesia (See Varian's
"giant", p. 256).



A well grown lioness.



lions made off, and Shane came back with only a few scratches, but my poor Sheila crawled back later, only just able to drag her hind legs along the ground. She had been struck or bitten through the back, and I could do nothing for her. She died next day, and it was a sad loss to me. When she was buried near-by, I took no chance of the hyenas digging her up, and had most of the camp-building Mashukulumbwe carrying stones from the hillside to build a big cairn over her grave. Possibly some of those stones are now incorporated in the hotel building, which was later erected on the same site.

We had several encounters with lions in that part of the country, and as a result of one of these, we lost a good pointer-dog a few months later. A friend of mine called Micklem, afterwards a distinguished officer in the first Tank Corps in World War I, was camped near me. One afternoon we decided to go up river for a few miles, to a spot where there was good bird-shooting. He had the loan of a pointer for the occasion, and as we only intended to shoot birds, we did not take a rifle. We took one small native boy and the dog with us in the canoe, landing a few miles up the river, still well in sound of the riveting in progress on the bridge-works lower down.

Where we landed there was a patch of open ground some 150 yards in length, which was flooded during the rains, but at that season was dry and burnt, lying below the level of the light bush country. The dog, who was fresh and keen, immediately ranged wildly up towards the bush, while we got ready to follow. In front of us there was a patch of unburnt reeds, and we went round it, one on either side. There on the open ground beyond, half-way between us and the bush, a very fine lioness stood watching us. We closed in, and agreed to walk slowly towards her, as close as she would allow us to approach, holding our fire until she charged, or until we were within ten yards of her. The light bird-shot, which was all we had with us, would be quite effective, but only at very short range. She was a magnificent sight as she stood there, waving her tail slowly from side to side. She

let us get to within 25 yards without moving, and looked like coming on, when the dog suddenly decided to return in response to our repeated calls. He came back on a line directly in front of her, and failed to see her until he was quite close. By that time he had diverted her attention, and she crouched for a spring. It was too far for a shot from us. The dog gave a yelp and made for us as soon as he saw what was behind him, but it was too late. With a movement that was half spring and half rush, she made for him, just missing him. Like lightning she wheeled round, sent him sprawling with a powerful blow of her off paw, then followed up and caught him in her jaws. It all happened in a matter of seconds. There was no chance of shooting without hitting the dog as well, and then there was just a scuffle in a cloud of dust and burnt veld, when it was impossible to see what was happening. We were then about fifteen yards away, and when she saw how close we were, she dropped the dog and faced us. Micklem fired, but it was too far for the shot to take effect. She growled, and turned to go, and as she did I fired both barrels at her stern. There were more growls as she moved away at a faster pace, her near hind leg going short. She stood again and faced us, and, loading as we went, we ran towards her; but she had had enough, and disappeared in the bush beyond, where it was useless to follow her, lightly armed as we were. We managed to get the dog back to camp, but he was so badly mauled that nothing could be done to save him, poor fellow, and he died the next day. Early next morning we went out after our wounded lioness again, with rifles, but were too late. She had charged a transport rider from the bush where she was lying up, a fellow who was bringing in sand for the bridge from a pit near-by, and he shot her. When we examined the skin afterwards, the shot marks were plainly scattered over it, but had hardly penetrated it, except for the hind leg, where we had lamed her.

Besides the preliminary work for the Kafue Bridge, there was also similar work to be done for the four major bridges within the section of fifty miles to the south of the river, in readiness for the arrival of the fast-approaching railhead.

There was also inspection of the work beyond. For this work, I kept my transport of mules and ponies on the south bank. The country to the south, like that on the north, was a veritable paradise of undisturbed game, which showed no sign of fear and in fact at times ran in front and at the sides of the mule cart. In one place I passed several times through a herd of over a hundred eland, the largest of the African antelopes. The last time I passed through this herd, I told my coloured driver to drop the reins and let the mules graze, which they were always keen to do. We both lay down on the floor of the cart, and the whole herd came up to examine this strange phenomenon, clustering close to the sides of the cart, sniffing and blowing and exuding the sweet, homely scent of cows. It was extraordinary to see that close array of straight horns all around us, and when we moved off they made no attempt to run, but stood staring after us until we lost sight of them.

Shortly after, some of the first ox-wagons came up to the bridge-site with loads. On my next trip south, the herd had broken up and vanished. All that remained of it were those who had not had the luck to get away—a number of bloated corpses lying scattered on the plain in the sunlight, ruthlessly shot by the transport riders out of sheer lust for slaughter. I wrote to Robert Coryndon, the Administrator, reporting this wanton destruction, but the damage had been done, and that part of the country disturbed for all time.

During this period I had prepared the plans for the masonry of the bridge, and set out the actual site. This needed careful attention, as the bridge was to be fourteen hundred feet long, the longest in Southern Africa at that time, and it was proposed to start construction from both ends. The steelwork was of standard design of 100' spans, designed and fabricated in England for erection *in situ* on its arrival.

The first white man to arrive was a Greek sub-contractor, sent forward by Paulings' to start the earthworks through the swampy approach on the south side of the river. His gang was composed of natives from the South, who possibly despised my naked Mashukulumbwe. I warned the Greek

not to interfere with my labour, and to keep his own boys in hand, but my warning evidently went unheeded. A few mornings later a very frightened man crossed to my camp on the north bank to tell me that some of his boys had been murdered and others wounded by the Mashukulumbwe, who had come into the camp at night and stabbed them with their assegais. They had threatened the Greek as well. I gathered that some of his gang had interfered with the local natives, and this was their reprisal. The few police in the country were not yet operative in that area, nor were any administration posts established as yet, outside Kalomo, or south of the Kafue. Police eventually were sent up, but the murderers were never caught. This fortunately was the only unpleasant incident of that nature during the construction to Broken Hill.

Plate-laying was continuing rapidly from the south over the easy country of the Batoka Plateau. On one occasion $5\frac{1}{2}$ miles were laid in one working day, near where Pemba is to-day; a record then for that type of line. This rapid advance was first checked by the necessity of bridging the Magoy River, the first bridge of any importance after the crossing of the Kalomo River, over 100 miles to the south. The temporary bridging of the other three rivers between Magoy and Kafue, the Mazabooka, the Calai, and the NegaNega, caused further delay, but in spite of this, rails reached the Kafue three months ahead of the contract time of a mile a working day.

As the rails approached, ox-wagons began to arrive at the site, loaded with various materials. First and most important was the steelwork for the ninety-foot pontoon. This pontoon was a great success. It was able to transport one engine, or two loaded trucks, across the river at a time. It was also able, on one occasion, to launch and place in their permanent positions, three steel spans in one day. It was not until several months after the rails had reached Broken Hill that the first train crossed the completed bridge.

Due to the soft nature of the swampy ground north of the river, only lightly loaded wagons could cross for the initial

plate-laying. These were drawn by oxen, whose span was known as Engine No. 32. After the first mile across the swamp, it was possible to transport material for raising the formation on a sounder base. The first engine was then brought across, and run over the new line. Although in the broken country north of the river, there was far more work in the formation, and many more openings and culverts were required, the rate of progress was maintained without serious delay for the remainder of the contract. As each temporary, or future permanent siding was reached, convoys of ox-wagons were drawn up, waiting to take stores and materials to the gangs and works ahead.

The night that the rails reached Lusaka, the present capital of Northern Rhodesia, the siding was laid. As usual, some ten ox-wagons were in waiting, the backs of the wagons close to the siding, and the spans of oxen lying down tied to their trek-tous, stretching away into the darkness beyond, all ready for loading and moving off at daybreak. Lusaka was the worst place on the section for lions, and they had caused a certain amount of trouble with ox-transport already. There were no lights in the new siding; except for the headlight of the engine, the world was in darkness. Heedless of the noise of the engine and the shunting, the lions actually came in that night and killed some of the leading oxen where they lay on the trek-tous, although they could not get them away. Marsland of Paulings' had his camp on the other side of the river. He had a large cat there, which had been with him in many camps, and which always slept in a chair by the camp fire. One night the cat disappeared, and the only indication of his fate was a very distinct lion-spoor running across the camp-clearing from an overturned chair.

The earthworks were well ahead and soon completed, with the plate-laying close behind. Broken Hill was reached on 11th January, 1906, thus fulfilling the contract in the specified time. Some of the plate-laying gangs had been with Paulings' on the work for many years, in some cases even from the start of the line from Vryburg in South Africa. As a final exhibition of their skill, the last half-mile into Broken Hill

was laid with materials off-loaded from the plate-laying train behind, carried forward by hand, and laid with such rapidity that the train passed over the newly-made track without a pause, or even a slackening of the turning of its wheels.

Parallel to that final rush, in the heat and dust and noise, a herd of oxen was being driven up to be handed over by Lawley as a present to the plate-laying gangs at the finish of the work.

The last dash was recorded in a cinematograph picture. Cinema photography was then in its very early infancy, and the Pathé ciné man who braved the wilds was, as far as I know, the first to come to Rhodesia. He had a very energetic morning, busily dodging from one antheap to the next (and there were many antheaps in that country) in his attempts to keep abreast of it all. He also took some pictures of the launching of the steel spans of the Kafue River Bridge, on the occasion when three were launched in one day.

The 110 miles of line, and the bridges from Kafue to Broken Hill, were built entirely with materials ferried across the river on the steel pontoon. It was not until this section was completed, and the line ready for handing over to the Rhodesia Railways, that the first train crossed the completed bridge over the Kafue river. There was no formal ceremony, in fact the opening was decidedly informal. A train came up from the south consisting of Paulings' coach, with George Pauling, Doel Zeederberg of South African stage-coach fame, and James Butler, of Pauling & Co.; Lawley's coach, with S. F. Townsend, Chief Resident Engineer from Bulawayo, and other visitors; and my service coach. Paulings' coach was at the rear of the train, with a four-wheeled truck attached containing hams and other foodstuffs, and cases of drinks for the bridge hands. During the construction of the bridge, Lawley had forbidden any liquor in the camp south of the river, so this was the first hard drink they had seen for a long time.

The train stopped at the camp on the south bank, and loaded all the hands onto the truck behind, which was on the same level as the platform of Paulings' coach, where we were all standing. It crossed the bridge slowly in the light of the

sunset, and stopped clear of the bridge on the northern shore. Cases were opened, drinks were served, and many toasts were drunk. The gang undertook to push the truck back to the siding on the south side again, so it was uncoupled, and our train moved on to Broken Hill. When we returned a couple of days later, a sorry sight met our eyes. Judging from the quantity and quality of the black eyes and other casualties, the bridge had been well and truly opened; each riveting squad had celebrated the occasion separately, by individual trials of strength in pushing the now much-travelled truck over the bridge and back again.

Soon after this, the staff of the Beira and Mashonaland Railways, who were then managing all the existing railways in Rhodesia, came up from Bulawayo to take over the whole new section from the Falls to Broken Hill, for open-line traffic. The General Manager was still Mr. C. Wibberley, and the Chief Engineer was Mr. C. Corner. At that time, the Rhodesia Railways was purely a construction concern. The Beira and Mashonaland Railways, whose headquarters had been at Umtali until the lines from the north were connected, then moved their headquarters to Bulawayo.

After the rush came the reaction, when as I have mentioned, the goal we had been racing after at top speed failed to come up to expectations, and there was nothing like the traffic that had been promised. The necessity of obtaining additional traffic to make this long extension pay was naturally apparent, and it became imperative to carry the line still further north to tap the extensive mineral deposits of the Katanga.

Although Robert Williams had already obtained a concession for the construction of a line through the Portuguese territory of Angola, from Lobito Bay in the west to the Katanga Mines, this entailed 1,200 miles of new construction. A line from Broken Hill to Katanga would necessitate only 300 miles, of which 140 would be in British territory. This latter route was obviously preferable, but there were powers in the south with whom the decision rested. Although it would have been in their interest to extend the existing line to the Congo Border, they made claims out of all proportion

CHAPTER VII

THE VICTORIA FALLS

DURING 1905, while the Victoria Falls Bridge was under construction, Everard and I had been detailed to begin a survey of the Zambesi River as a possible source of power, in the vicinity of the bridge and above the Falls themselves. A great deal of the preliminary work was completed in that year, but a number of channels remained to be surveyed, their lowest water volumes determined, and other data collected for the prospectus of the company then being formed under the name of the Victoria Falls Power Scheme.

The company was eventually formed, and a concession granted, but instead of proceeding directly with the scheme of utilising the water-power of the Falls, the company devoted its energies for the time being to the development of power from the coalfields in the Transvaal—a project now under the direction of a highly important and successful Corporation. At a later period, in order to retain the concession, a small plant was installed at the bend of the third and fourth gorges, sufficient to serve local needs only. Were the full power to be developed later, it was intended to site the plant in a dry tributary lower down the fourth gorge, where a head of 400 feet would be available.

The Victoria Falls have been so well described by brilliant writers, both past and present, that it is superfluous to attempt a further description of their grandeur here, even if I were able to do justice to the theme. Sight-seeing is so well organised to-day that visitors are introduced to every point of interest, no matter how small. Though nothing can detract from the wild beauty of the river and its gorges, the surroundings of the Falls are now greatly altered from the primitive state in which we found them on the arrival of the railway in 1904. Before that time, owing to the inadequacy

of existing transport and the hazards of travel, it is doubtful if more than a hundred or so white people had ever seen them, not counting a few missionaries and officials in Barotse-land, north of the river.

The various dimensions and other items of interest gained in these surveys were published in 1906, but even thirty years later the original fable persisted that the height of the Falls was 420 feet, and the gorge below the bridge was bottomless. In order to correct these errors, I wrote a paper, which was published by the Royal Geographical Society in 1934,¹ giving some notes on the original survey. I use this paper extensively in the following paragraphs, as the details may be of interest to those who have visited the Falls, but who may not have had my good fortune in learning to know them intimately.

A cross-section of the gorge below the bridge-site was made as part of the work, and soundings were taken from the bridge. The bottom was found to be extremely rough, either from fissures in the rock, or more probably from the presence of rock débris and boulders. The cross-section showed that the river shallowed under the right bank, and the bed shelved in a more or less even slope for nearly three-quarters of the distance to the left bank. The deepest sounding at lowest water in 1906 at this point showed a depth of 56 feet. From that point there was a steep rise to the cliffs on the left side of the gorge, and the highest flood mark to be found at that time was 45 feet above lowest water level. This would make the maximum possible depth of water, when the river was in flood below the bridge, about 101 feet. The area of the cross section at lowest water-level was approximately 7,500 square feet.

Five miles above the Falls, at Secuti's Drift, near the original township of Livingstone, the highest flood-marks found at that time were seven feet above low water. So, comparing this with the records of the gorge below, there was roughly a six-foot rise in the gorge for each foot of rise in

¹Notes on A Survey of the Victoria Falls in 1905-06. H. F. Varian. Reprinted from *The Geographical Journal* Vol. LXXXIV, no. 1, July 1934.

the main river above the rapids. This is naturally only a rough approximation, owing to the unevenness and widening of the gorge, with the increasing depth of its cross-section. The highest flood-waters recorded in those years were between 18th and 23rd April. This coincided with the heaviest rains on the head-waters of the Zambesi in Angola, which invariably occur early in April. This is the river's principal source of supply above the Falls.

An interesting experiment was made at the time of these surveys, in testing the currents of the whirlpool at the exit of the main stream from the Boiling Pot, near the bottom of the Palm Grove. Mr. Frank Sykes, who was then Commissioner at Livingstone and had had much to do with the Falls in the early days of the occupation of Northern Rhodesia, was keenly interested in everything concerning them. After a discussion with him, an old Canadian canoe which was useless for any other purpose was produced, and carried down the Palm Grove. It was then launched on the edge of the whirlpool.

We failed to get it to go far from the shore, owing to the surge, and to local eddies, but finally solved the problem by weighting it unevenly, with stones, varying the weights each time it did the round of the local eddy. It took a different route every time, sometimes to the other side of the gorge, always on an erratic course, and for an hour it returned at the end of each trip. At last, when it was so loaded that one end was clear of the water, it eventually dived on the upper edge of the main whirlpool, near its junction with the Boiling Pot, and in the main current, but up the gorge towards the Falls. It came to the surface again some 100 yards down the main stream in a vertical position, showing half its length above the water. The dive and its direction seemed to indicate that there is a steep fall or pot-hole in the bed of the gorge between the Boiling Pot and the main stream of the gorge. In a minor way we had the same result when trying the currents of rock channels in the river above with floats and vanes. When they left the surface, soundings showed a drop in the bed of the channel. Nothing further was seen of the

canoe after it passed down the gorge, neither did it appear later in the dead water at the hotel end of the second gorge, a sort of Sargasso Sea where all floating débris usually collected.

At lowest water, the deepest point found in the river above the Falls was 33 feet in a channel 156 feet wide. This is about a mile and a half from the lip of the Falls on the northern or left bank. This channel evidently found its way through a soft fissure in the rock extending a good way across the river and continuing to form Princess Christian Island, opposite Giese's Drift. After leaving the abrupt turn at the exit of the narrow channel under the left bank, the waters run diagonally across the river, and become shallower. This stream then passes behind Livingstone Island to form the main fall. Its deepest point, as far as it was possible to go, was 14 feet, just beyond Hippo Island towards Princess Victoria Island, the big island at the back of Livingstone Island. It was suggested by Professor Lamplough, who visited the Falls at about that time on a geological survey, that this main channel might be the site in the future of yet another gorge. The channel evidently deepened as it approaches the main fall, but further soundings could not then be taken, as the "drag" of the fall began to be felt at that point.

The deep narrow channel under the left bank is also an important one. It is well situated should the main power scheme ever be developed, for when the river is at its lowest two-thirds of the total volume of the whole river passes through it. It is here also that the intake of such a scheme would be sited. The only other definite channel in this section of the river is at the far end of the rock bar, which is only exposed at low water, and Princess Christian Island, referred to previously. At lowest water this channel is only eight feet deep, and carries one-sixth of the total volume of the whole river.

Beyond these two main channels is the densely forested Princess Christian Island, which is nearly half a mile in length, and extends in the main direction of the rock bar

across the river towards Giese's Drift, the nearest navigable point for canoes and launches on the right bank above the rapids. From the end of the island to the right bank, there is a 300-yard expanse of open water, broken with outcropping rocks, rapids and shallows. This is a picturesque and beautiful stretch of the river, with its background of heavily-wooded island, and the spray of the main fall beyond. These waters eventually converge to form the Western, or Devil's Cataract, on the extreme western end of the Falls. Although there appears to be a large volume of water in this broken stretch, in reality only about one-sixth of the total low-water volume flows over it.

Mr. Soper, with another man long resident at the Falls, descended to the bottom of the Chasm down the cliff-side of the eastern face of Livingstone Island. Mr. Soper described the first part of the descent, made with the aid of ropes, as precipitous, but the lower part as moderately easy climbing. They also took a small light canoe, and worked their way along the bottom to a small island in the middle, but it was not altogether a pleasure trip, and they had no desire to repeat the attempt.

The bottom of the Chasm rises about 160 feet from the bottom of the cliff facing the main outlet to the Boiling Pot, the height of which is 357 feet and the highest point of the Falls. This western fall therefore is approximately 200 feet from the level of the water in the main river above. The Rainbow Falls to the east and the Main Fall to the west of Livingstone Island are approximately 320 and 275 feet respectively in height. This steep rise in the bottom of the Chasm is possibly accounted for by the mass of débris and boulders brought down by the Main Fall as it cut its way back through the softer fissure.

Towards the east, in the quarter-of-a-mile from the deepest cliff face of 357 feet, the bottom rises steeply. The eastern cataract is about 310 feet deep, and the rise continues to the extreme end of the Chasm, where the cliff height is approximately 285 feet.

The width of the whole cliff-face was measured as 1,850

yards. During the wet season there was a clear fall of water covering 1,500 yards of this distance, the remaining surface of 350 yards being filled by islands.

A provisional power station, to satisfy the conditions of the concession, has been built at the end of the gorge above the Silent Pool, where the water level was found to be 32 feet below that of the Palm Grove. A comparison of the potential power in the two sites, utilising all available water at low level, would indicate: Canal from intake to Silent Pool—one and a half miles with 200,000 horse-power; and Canal to the farther ravine—two and a half miles with 250,000 horse power.

After the fourth gorge the bends in the river are not so abrupt, the cliffs are higher and not so uniform, and although the river-bed falls, the general level of the plateau remains the same, though the country becomes very broken on either side. About ten miles across country from the Falls, the cliffs are nearly 700 feet in height from low water level to that of the plateau above. Here the cliffs are no longer vertical, but have retained their natural character as very steep slopes. These slopes are extremely rough, covered with thorn and dense undergrowth, and studded with large boulders. Near this point, there is a fall in the bed of the river, over which the whole of the low-water stream flows, through a narrow gap, with a drop of some sixty feet. The sound of it is audible several miles away. The surrounding country was uninhabited at that time—a dry wilderness where it would have been quite possible to die of thirst within sight of the water below.

During this survey, I was camped on the slopes above the river, nearly half a mile from the water and a mile from the top of the Palm Grove. From these slopes there is a very fine effect of sun and spray which is at its best between seven and eight o'clock in the morning at the end of the dry season. At high water, there is too much spray. Viewed from the high ground, the wide sheet of still blue water stretches from the bank to the deep green of Livingstone Island and the Rain Forest beyond. In sharp contrast, the huge column of dead-white spray rises slowly from the Chasm, and drifts across to

the west. Varying always with the month, the day, and the very hour, the vast cloud takes on all the colours of the rainbow, which shift and alter slowly in the rays of the rising sun. Within a quarter of an hour or so, as the sun climbs higher, the rainbow colours fade, and the column is again a dazzling white. The view is still magnificent, but has lost the unearthly splendour which never failed to thrill me, even though I watched it every morning.

In that camp I learned to know the various sounds which blended together to form the mighty roar of the Falls at night. I could "tune in" to each separate sound—the gurgling race of the water over the rocks and rapids, the rush of the fall past the cliff-sides, and the harsher note as it struck the rocks below, the roar of displaced air in the Chasm, and the uplift of winds carrying the spray, with lighter, softer notes caused by the whirl of wind in the dense falling rain and spindrift. It was a curious thing that from sundown onwards, the sound of the Falls died away, and was scarcely audible in the camp until 9 o'clock or a little after, when the whole orchestra would break out again and persist through the remainder of the night. Several suggestions were made to account for this curious interval of silence, so distinct and so regular, but we never really decided on the reason for it. At that season and during those hours there was practically no wind, which may have been the explanation.

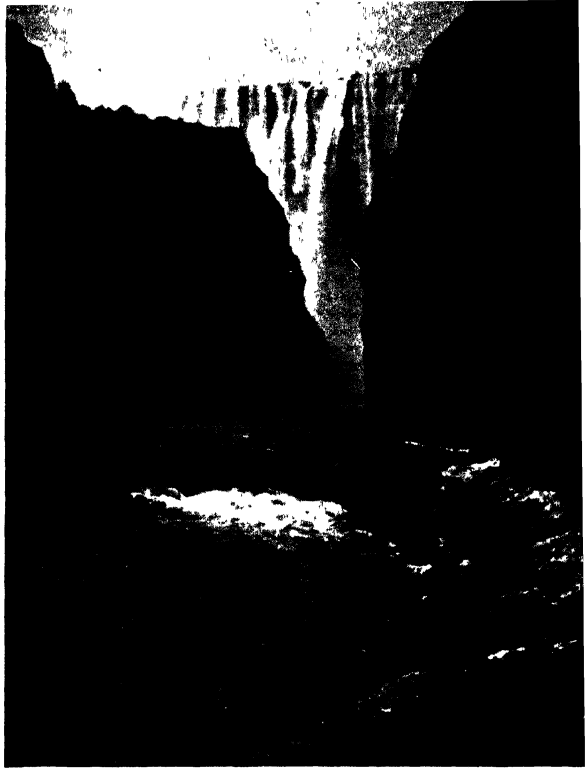
Another rainbow effect which is far better known is seen in the gorge at about 2 o'clock in the afternoon during the months of September or October, when the sun shines directly along the floor of the main Chasm. To see it at its best, one must cross the small stream to the east of Livingstone Island, where there is a salient into the gorge capped with a short grass lawn, about thirty feet square. From this point there is a clear view up the bottom of the Chasm towards its eastern end. At that time of the year, there is just sufficient spray to catch the sunlight. The delicacy of the rainbow mists has a perfect foil in the cliffs of black basalt on either side. The gorge is filled with a stream of light and colour which drifts to the end of the Chasm and disappears. In a

THE
VICTORIA
FALLS

The Eastern
Falls.



rain Falls and
Boiling Pot''
om cliff below
Palm Grove.



Twen
mile
below
Mar
Falls

short twenty minutes the spectacle is over, and the spray is white once more. The famous lunar rainbow, a magical sight impossible to describe, is visible all the year round, but is usually at its best at about 8 p.m. two days after the full moon.

One day I got rather too close to the drag of the main fall near Livingstone Island, involving myself in a situation that might have been fatal. There were a number of hippo in the river, whose favourite feeding grounds were on the islands, and on the north bank. The main herd consisted of eleven full-grown animals and three smaller ones, usually to be seen when sleeping, bunched closely together, and half submerged, the little ones on the backs of their elders, in a small bay on the island immediately across the main channel behind Livingstone Island. On several occasions when I was sounding the channel in the early morning, with the sun at my back, I had managed to come quite close to them without disturbing them as they drowsed in the water, densely packed. It occurred to me that they would make a good photograph, and I planned a camera campaign.

I had three large Canadian canoes for use on the work, each with a crew of four excellent Barotse paddlers, working two in the bow and two in the stern, who were well used to the rapids in which we had been working. The garb I wore on the job was simply a shirt and a hat, in case I was tipped out into the stream at any time. I explained to the picked crew of the canoe selected for the photographic party the general idea of what I wanted—to keep the canoe directly between the low rising sun at our backs, and the hippo ahead. The canoe was to be kept down the current with the paddles in the water, but the paddles were not to move until I gave the word, when we were to get away as fast as possible upstream.

I took my place in the bow, standing with my camera ready, while we glided up towards the herd, still apparently asleep. Everything seemed to be all right, and as this would be my only chance of such a photograph, I unwisely waited until we were too close. Then, without the order to move, and before I could get the picture, the canoe suddenly spun

round, throwing me off my balance and saying good-bye to the picture for ever. We had approached so close that the whole startled herd had taken to the water, producing a nightmare effect. The river around us was a seething mass of hippo, bobbing up on all sides at once, and actually touching the canoe at times. Luckily it was travelling as fast as four expert and extremely frightened paddlers could move it, otherwise we should certainly have overturned.

Eventually we extricated ourselves from the mess, and made for an island on the north side of the channel, where we landed and waited until the riot subsided. Being considerably annoyed by then, I demanded an explanation as to why the crew had disobeyed my original order. They were good canoe-boys, and as we had been together through practically all the rapids in the river above, I had to accept their story. They told me that they were not afraid of the hippo, but a sudden current had caught them and pulled the canoe into a "drag" of the current of the main fall. Naturally they had felt this and I had not, and they had acted thus promptly, to avert disaster. We were well out of what might have been a very serious position—but I have always regretted the loss of that unique picture.

Apart from the main herd, there was a cow with a very young calf, in a pool below the camp, where the canoes were kept. At first we were very shy of her, and on going out to work in the mornings and coming back in the evenings, we kept very close in to the bank until she got to know us, and we to know her. She would come to the surface, looking a really kindly old thing, with her calf, which we named "Little Eustace", always on her back. He was very pink, with a big, shovel-like head, on the end of an extremely small body, supported by little bandy legs with badly-splayed feet. His general appearance was more that of a badly-stuffed port-manteau than a future river-horse, but at any rate his mother was proud of him. On one occasion, while we were watching, he overbalanced. From his appearance, this must have been an ever-present danger. Mother went down to collect him, and appeared shortly after with "Little Eustace" on deck

again for exhibition. The pair appeared regularly at the time of our evening return, and when she had made sure that we were safely home, mother would submerge with a snort which seemed to say: "It's only you again—good night." We always remained on good terms, and I really believe the old thing had quite an affection for us.

Until then, the hippo in the river had remained unmolested, and gave no trouble. Later on, some misguided visitor on the Giese's Drift side started shooting at them. Wounded hippo in a river are a nuisance, as I had experienced before. The animals on my side of the river, where visitors were not allowed, were quite harmless; but on the other side, after they had been stirred up by that regrettable incident, there were subsequently several accidents.

On my journeys in Africa, I have visited and re-visited both the Victoria Falls on the Zambesi and the Murchison Falls on the Victoria Nile in Uganda, which are without doubt two of the most wonderful sights to be seen in all Africa. As they differ fundamentally in every way, there is no question of ever comparing one with the other on points of magnificence. Taking their volume of water as equal—which at one period or another they must be, although situated in different seasonal zones—the former flows over a vertical precipice some 360 feet in height and more than a mile wide, while the latter, after draining the second-largest lake in the world, Victoria Nyanza, concentrates its flow some 200 miles farther down, and falls in two sharp steps through its narrow gorge. Each has a distinction amounting almost to a personality, and a grandeur definitely its own.

The Victoria Falls are now developed as a tourist Mecca, their surroundings well settled, and their beauty preserved as it should be for numerous visitors to see them at their best in all seasons. One gladly avails oneself of the present ease and comfort of it all, but at the same time it is very pleasant to look back on the days of their wild and primitive state.

The Murchison Falls are situated in less accessible country, surrounded by game of every description in the local game reserves, both on land and in the water. The country around

them is uninhabited owing to sleeping sickness, so at present there is very little chance of their setting being disturbed in any way. With the exception of those who have made use of the occasional trips to the Falls organised by the East African Railways in their river and lake-steamers from Butiaba on Lake Albert, few people have visited them. It is only possible for the shallower-draught steamers to ascend the Victoria Nile from Lake Albert, during the months between December and March, although some of the smaller launches are able to make the trip over a longer period.

The Nile, after it leaves Lake Victoria Nyanza at the Ripon Falls, is now being developed as a source of hydro-electric power. The Murchison Falls, some 200 miles further down the river, are almost too remote to present any possibility of power development, at any rate for many years to come. Under these conditions, even in this world of constant change, they should retain their primitive character for many more years, and here at least one spot remains in Africa which Adam might recognise could he return to earth.

The Rhodesias are extremely fortunate in having such a river as the Zambesi, with its sources of power so centrally placed for the requirements of both countries. There is a minimum of 250,000 horse power available at the Victoria Falls, without the necessity of a dam. The gorge of the Kafue River holds another vast amount of power, as yet undefined, while the waters of these two rivers in the main Zambesi combine to form the volume at the Kariba Gorge which, when fully developed, will produce 1,000,000 horse power, possibly even a million and a half in all. The principal sources of the Zambesi, the Kwando and the Lungwe Bungwe Rivers in Angola, unlike others in the southern parts of Africa, rise in sandy countries, where there is a large rainfall, and where the flat nature of the countries they traverse induces a slow run-off. They are therefore freer from silt than others rising in more mountainous country, another important natural advantage. Silt, which is more or less a necessity in rivers used for irrigation, is a bugbear in the development of hydro-electric schemes.

CHAPTER VIII

GWELO-BLINKWATER RAILWAY

THE season 1905-06 had been a dry one, but the following one of 1906-07 certainly compensated for it, as I have good reason to remember.

The branch line from Gwelo had been completed to deal with the chrome-ore traffic at Selukwe. Other mineral deposits, fifty miles further to the north, were also being developed, and needed extensions of the railway for their expansion. It was decided therefore to continue the line to the north, with the idea of extending it later as far as Victoria. The material for these extensions would be the lighter section rails still available from the old Mafeking section, which had been replaced with standard materials.

On the completion of the work at the Falls, I was detailed to locate and construct the first section of a new line which I took off from a point seven miles out on the Gwelo-Selukwe branch. After completing the survey to Blinkwater, where the first mines were situated, there was a delay. The construction was not begun for some time thereafter, and was eventually done on contract by Paulings'. Their preliminary survey was destined to be my last work in Rhodesia.

After entraining with the party, natives, and transport at the Falls, which I was very sorry to leave, we duly off-loaded at the selected point on the Selukwe branch. Owing to outbreaks of red-water and East Coast fever, the country was closed for ox-transport, and all movements of cattle were prohibited. The Chartered Company had imported thousands of donkeys, which they distributed among the various transport-riders, but they were a very poor substitute for oxen, especially in that unusually wet season. It was said that anyone who had ever driven a donkey-wagon had no chance of salvation in the next world. It was certainly pathetic to see the hefty

transport-riders struggling with their dreary little teams, whose long, drooping ears and martyred expressions gave them the appearance of being for ever in the last stages of exhaustion. It was difficult to reconcile their air of patient suffering when inspanned with the kicking, squealing, biting mass that subsequently emerged from the harness. My party had to "make do" with a light wagon and a team of eight mules, to serve for everything in the way of transport. It was fortunate for us that the route, to begin with, ran near the main road, and so saved us the necessity of breaking new ground.

I had with me three white men, and twenty-five natives, most of them Barotse. One was a Mashukulumbwe, who lived in a world of his own. His job was making and driving the survey pegs. Local Mashona labour was not available, but even if it had been, they were a poor lot in comparison with the more sophisticated Barotse. Unfortunately my gang included a number of thieves, who thought that, being away from home among a people they considered to be inferior, they were entitled to help themselves to anything they fancied. Before long, complaints began to come in from the neighbouring villages of petty thefts of grain, honey, and other produce of the fields we passed through. When it came to thefts in the camp itself, the time had arrived to take action.

In those days, all pay and currency was in good golden sovereigns and real silver. Paper money, except for "fivers" and higher denominations, had not been heard of. When Jim, the solitary Mashukulumbwe, came to me and complained that a sovereign of his recent pay had been stolen while he was asleep, I decided to make a thieves' "muti" or medicine. The sophisticated considered this a great joke. I concocted a highly-coloured mess from the foulest ingredients in the medicine chest—all harmless—in full view of the whole gang, who formed a group around me in the firelight, taking the greatest interest in what I was doing. I explained that there were thieves in the camp, and now matters had taken a very serious turn, as Jim had had a sovereign of his pay stolen.

I explained that we were all to drink this medicine, myself included. Whoever the thief was, he would be violently sick, either then or later, and in this way he would be detected. There were cynical smiles around me. By way of cheering things on, I fired a small piece of magnesium ribbon and plunged it into the mess. The brilliant flash shook them a little, and the smiles wavered. I then raised the bowl and took what appeared to be a deep draught from it. Everyone drank deeply in their turn, and in fact at one moment it seemed there would not be enough to go round, but I was spared the necessity of having to go through the whole performance again. When the last drops had been consumed, we parted for the night.

Next morning early, my personal boy came into my tent. He came from Nyasaland, and did not live in the labour lines, so had been exempted from the proceedings of the night before. I asked him if anything had happened, and he told me that although no one had confessed to the crime, they had all been sick, and the sovereign had mysteriously reappeared. He was slightly mystified, however, as they could not all have been guilty of the crime. I explained that it was a thieves' medicine, which did not apply only to the disappearance of the sovereign, and if inquiries were made, it would be found that the other sufferers were guilty of the various recent thefts all over the neighbourhood. The foul mixture of *nux vomica* and other odds and ends did them no real harm physically, and the moral benefit was great. We had no more complaints from the villagers during our stay.

On another occasion, the work was delayed owing to malingering among the limited labour. This seemed to be an organised affair, as each day a new lot laid off work. I dealt with this again in a somewhat unorthodox way. One morning when the gang paraded, the sick remained on one side, wearing all the signs of woe that an African can affect when endeavouring to persuade you that he is at death's door. I commiserated with them, telling them that they must take great care of themselves while the rest of us were out working; and, expressing a hope for their rapid recovery, I suggested

a cure which might perhaps be effective. I made them show me their tongues, which of course showed every sign of rude health. Then I produced a small bottle of croton oil, dipped a feather in the oil, and adorned each patient with the sign of the cross, and a small circle. The working gang, who were looking on, were quite mystified, and the patients were decidedly apprehensive, as none knew the potency of this charm. When I called for the sick parade next morning, all were bright and cheerful, and the epidemic disappeared as rapidly as it had come.

Like all Africans, this gang had its own superstitions, which they were shy of admitting, but to which they were irrevocably committed. In this aspect of native life, the European cannot interfere. We used to see a manifestation of this superstition alongside the paths, or at the crossing of tracks in the remoter parts of Central Africa, its purpose being the warding off of evil spirits from a village where there was sickness or other trouble. It generally consisted of a small clearing in the bush, on which was placed a miniature hut, with a branched twig near-by, and a few grains of food. The idea was that any approaching spirit would billet himself there instead of advancing on the village.

It happened that one of our party was suddenly afflicted with epileptic fits, which visibly alarmed the other natives of the gang, who became reluctant to work near him. One day I came on a microscopic replica, well hidden, of one of these "spirit rests", which hitherto I had only seen in the north. The clearing was only about three inches in diameter, containing the twig-perch, the food, and a hut about the size of a thimble. It was concealed under the fly of the tent, and had I not known what it was, it would have passed unnoticed. Seeing that the gang was really perturbed, I sent the sick man away. No mention was ever made of the spirit home, but the food was replenished. I kept an interested watch on it, and not until a new man was engaged and there was obviously no possibility of the epileptic returning, did the little dwelling disappear without trace.

It was in that country that I encountered, or rather made a

hurried escape from, a black mamba, one of the most deadly snakes in Africa. This happened near a spot where a Government surveyor had had a narrow escape from one while out shooting, some months before. One of his boys shouted a warning from behind, which saved his life. The mamba passed him, but struck as it went, and killed his pointer dog in front of him.

After months of an extremely wet season, the field work of the survey was completed, and we were not sorry to return to civilisation. We were on the last trek in to Gwelo, the party with the transport travelling on the main road, while I rode some distance away along the line of survey pegs that had been driven in some months before. As it was early morning, there was no breeze, but a slight rustling behind me gave me that indefinable sense of apprehension that all was not right. Nor was it. I looked back, and beheld as evil a sight as one could wish to see at any time. I was being followed by a black mamba, which had been disturbed a short way back, and was disliking me intensely.

He was advancing at a good pace, swaying from side to side, the vicious head held above the grass which was about two feet high and supported him in his pursuit. He was about four yards behind me, his head on a level with the pony's hocks. I struck the pony with both spurs, cutting him with my sjambok at the same time, and like a certain person in the scriptures, looked not upon the order of my going, swerving as I went. It was some time before I dared to turn, and then to my infinite relief there was no trace of him.

Mambas are extraordinarily fast and agile, and seem to have no sense of fear. Several times the steel wheels of motor-trolleys on the railway passed over them, they made so little attempt to get out of the way. Once our wheels passed over the last six inches of a mamba's tail, and though disabled, it shot straight up into the air beside the open trolley. I went back with a shotgun to finish it off, and still remember the look of malignant hate in those bright red eyes as I advanced, and the open jaws with fangs extended. On another occasion, we saw one crossing the line ahead of the

trolley, which was travelling at nearly forty miles an hour. It seemed that we must run over it, but we just missed it. With incredible speed, it gathered itself up and struck the wooden footboard with a resounding crack which must have broken its fangs. I did not go back to look for that one.

Many years later, while on reconnaissance in Kenya, I was given another example of the ferocity of this reptile, one of the few snakes in the world which will attack on sight, and without provocation. I came on an open sandy patch in the extremely unpleasant dry bush south of the Tana River. Here the scene was set for a drama which had been acted and finished without an audience—but it must have been a grand show while it lasted. There, in the middle of the stage, lay the two combatants who had fought it out to a finish, with the evidence of their battle around them. There was nothing to say who had started the brawl, or why, but the struggle had been quite recent, and the actors lay stone dead, side by side and cheek to cheek, if such things have cheeks. One was a large monitor lizard, over three feet in length, and the other a black mamba nearly nine feet long. The lizard is a slow mover in comparison with a mamba, but this one had managed somehow to get hold of the snake's lower jaw, which was badly crushed. In that position, the venomous fangs must have penetrated the upper jaw of the lizard, and poisoned it. From the traces in the hard white sand, it seemed that the lizard had got a stranglehold on the snake's lower jaw, and the mamba had lashed round and round in a frenzied semi-circle, unable to free itself, until both died locked together, shortly before my arrival.

I shot a green mamba in a tree not far away in the same district.

It has always surprised me how few snakes are encountered in Central Africa compared with the number seen in the southern territories. When making a reconnaissance which entailed walking continuously for nearly three months from West to Central Africa through every type of bush and open country, I saw only two snakes during the whole period, and then they were extremely anxious to get out of my way.

To return to the last trek to Gwelo and Bulawayo, and the month of March 1907—we eventually arrived, with the loss of only one mule, and that on the last trek into Gwelo, which was lucky, as that was a very bad season for horse-sickness. We entrained there for Bulawayo, to rest, and finish the plan work, which was duly completed. I had been told that I would have to handle the construction, but there was a delay in the financial arrangements, and the work for the time being was held in abeyance.

There was no prospect of work in the immediate future, and so I went to England on leave, my restlessness, that curse of Africa, now fully developed. After a couple of months of idleness, time which I could neither enjoy nor employ, I had chances of service in the Sudan, Peru, the Argentine (with an old chief, Soley), or in Angola, where a similar type of railway to that of Rhodesia had been started on the concession granted to Robert Williams of the Tanganyika Concessions, with the same Consulting Engineers—Sir Douglas Fox and Partners, and Sir Charles Metcalfe, Bt. I surveyed the alternatives. As I knew Africa, and was not keen on starting afresh in new countries, I decided to return there. On 12th August, 1907, I arrived to take up new duties as Chief Assistant Engineer of construction on the Benguela Railway at Lobito in the territory of Angola—the opposite side of Africa to my starting-point of nine years before.

CHAPTER IX

THE BENGUELA RAILWAY, ANGOLA

ANGOLA, though Portugal's oldest African colony, was, until recent times, one of the least-known of all the African territories. This was partly due to its having been a penal settlement, and partly to lack of colonisation by nationals other than the Portuguese, with the exception of the handful of Boers who trekked there from South Africa about 1882, after the first Anglo-Boer war.

When I went out there in 1907, it was one of the very few countries in the world for which it was necessary to obtain a Foreign Office passport. In those days, a passport was a large sheet of parchment paper, similar to that on which English five-pound notes were printed, on which were engraved the armorial bearings and style of the Foreign Minister, then Sir Edward Grey. Endorsements and visas were recorded on the back of this document, which was handed to the applicant in the Foreign Office itself by a polite, frock-coated official. The whole procedure was in striking contrast to the modern method of queuing for the issue of a rather drab little booklet, and though possibly less practical, was infinitely more romantic. It emphasised the remoteness of my destination.

Angola occupies a large portion of tropical and sub-tropical West Africa, south of the Equator. It is situated approximately between 6 degrees and 17 degrees south latitude, and extends from about 12 degrees to 24 degrees east longitude. Contained in this is an area of some 480,000 square miles, with a coast-line of 1,500 miles.

On its northern and north-eastern borders lies the Belgian Congo; on the eastern and south-eastern borders lies Northern Rhodesia, and on the south, South-West Africa. In general, its climate is very good. The coast for the most part is washed

by the southern currents from the Antarctic, so it is therefore considerably cooler than countries in the same latitude on the East Coast, which are washed by the northern currents from the Bay of Bengal. Similar to the western coasts of South America and Australia, which lie also on the cold south-western currents from the Antarctic, the littoral is further tempered by southern winds, and is comparatively dry and waterless, with very little rainfall.

In Angola this dry belt extends inland for a distance of fifty to one hundred miles, narrowing in to the coast, and merging into more normally-watered country north of Lobito and south of Loanda, where the southern currents begin to lose their effect. The flora and fauna undergo a striking change on the coast in those regions. Allowing for the difference in latitudes, they resemble the flora and fauna of the dry country of the Kalahari and South-West Africa, of which this coastal belt is an extension.

Parts of the belt to the south near Mossamedes, north of the Cunene River, are sandy deserts, with practically no rainfall at all. Near Lobito, the rainfall averages from ten to fifteen inches per annum, which increases towards the north. In this area the heaviest fall is between February and the beginning of May, the maximum being generally at the end of March and the beginning of April.

The greater part of Angola is a high plateau, whose western rise, and escarpments, are anything between a hundred and two hundred miles inland from the coast. Here again the flora and fauna are entirely different. The main plateau holds the sources of some of the principal tributaries of the Zambesi, flowing to the south and east, and of the Congo, flowing to the north. The basins of the Quanza, which flows out south of Loanda, and of the Cunene River, which forms the southern boundary of the country, lie wholly in Angola.

The average height of the main plateau is from 5,000 to 6,000 feet, falling away to the north and south with the basins of the various drainage systems. Here in the high land the climate is excellent, rather like that of Northern Rhodesia, but tempered by its proximity to the western ocean. It is

never unduly hot, nor excessively cold, except in the month of July, when there are sometimes bitter frosts at night. The whole of the high veld is extremely well-watered, far more so than most of the countries of South Central Africa.

Extending as it does over such a wide area, Angola contains practically every type of country to be found in Africa, with the exception of the Equatorial Forest. The wild life that ranges over this wide territory therefore resembles that of other parts of Africa in the same latitudes and at the same altitudes, but there are also a number of species peculiar to the country. These specimens need earnest and careful hunting. Due to the wide distances that separate the various kinds of game, and the inaccessibility of the territory to the south-east where the more common varieties are most abundant, Angola is a game country for the specialist rather than an objective for the ordinary shooting trip, where a varied bag is the chief consideration.

The present scarcity of game in the more accessible parts can be laid at the door of the Boers who trekked there from the Transvaal, dissatisfied with British rule. Their trek took them several years, until after incredible hardships, they settled in the highlands in the early 'eighties. From that date until 1928, when they were repatriated to South-West Africa, they existed principally by hunting and shooting, with a certain amount of transport-riding thrown in. Wherever it was possible to penetrate the country with a wagon and oxen—and in many cases, the ox-wagon was the Boer's only home—game was almost exterminated. Prior to their advent, game was plentiful. The rinderpest also played a part in the destruction, accounting for great numbers, especially among the buffalo and kudu. The plateau sustains a large African population, who until recent years were permitted to carry muzzle-loading trade-guns. These, too, were responsible to a certain extent.

The history of this Portuguese colony dates, as far as European records are concerned, from 1485, seven years before Christopher Columbus discovered America. In that year, Diego Cao entered the River Congo, and negotiated a

treaty of commerce with the ruler of the country, whose vassal states were Loanga and Angola.

Dapper, the Dutch historian of Africa, writing in 1668, and Cavazzi, the Italian monk, writing in 1687, have described this mighty kingdom, which comprised much of what is now the French, Portuguese and Belgian Congo, and the province of Angola. In those far-off times, this African state was ruled by the Mani Congo, who, to quote Dapper, was "Lord of the Congo and Overlord of Angola and numerous other states, Monarch of the Ambundo, and Lord of the mighty River Zaire" (the Congo River itself).

After many expeditions and missions had been sent out, the Portuguese finally occupied the country. In 1595, the Dutch endeavoured to gain a footing, and it was not until 1650 that they were finally excluded.

The beginning of the 19th century was notable for the excellent governorship of Antoni da Gama, who not only developed the mineral resources of the colony, but directed his attention to the exploration of this part of Africa, especially to the discovery of a route from Angola to the eastern Portuguese possessions on the Zambesi River.

Two native traders were dispatched from Angola in 1801, and managed to reach Kazembe's village in what is to-day Northern Rhodesia, where Francisco Lacerda, the Governor of Portuguese Zambesia, had arrived with an expedition from the East Coast some years earlier. On their journeyings, they observed the presence of malachite in Katanga. Little, of course, could they foresee the immense development of the copper industry that was to come a century later, still less the construction of a mechanical railroad that was to traverse the regions they had so wearily trodden on foot. The Angolan traders finally reached the East Coast in 1811, ten years after they left Loanda, and returned by the same route via Kazembe in 1815.

The years 1820 to 1836 were marked by great commercial progress in the colony, but also by much social unrest. In 1836, a mutiny broke out among the European troops, whose discipline and prestige were only restored after a successful

campaign and the conquest of the district by the Duke of Braganza. The abolition of the slave trade came soon after, and this brought about profound economic changes.

In May 1854, Livingstone completed at Loanda the first stage of his famous trans-Continental journey, which began in Barotseland and continued north to Angola, ending at last at the mouth of the Zambesi on the east coast of Africa. On this journey Livingstone discovered the Victoria Falls, and also noted the presence of copper in the Katanga district.

The later commercial history of Angola may be said to date from the discovery in 1899 of the Katanga copper deposits by the expedition under Sir Robert Williams, the subsequent development of this mineral wealth, and the building of the Benguela Railway.

The first development of the country towards the interior was made by the construction of two light railways early in 1900, one of which ran from Loanda to Malange, a distance of 375 miles north of Lobito, and the other from Mossamedes to the Chelo Mountains and Lubango, a distance of 111 miles, to the south of Lobito. The Portuguese Government had already contemplated the construction of a railway to Caconda, one of the oldest and most important townships in the interior, a hundred and fifty miles south-west of Benguela. The survey of this line followed the old ox-wagon route of the Boers, traversing the waterless, mountainous country on the way to the plateau where Caconda was situated. Construction, however, remained in abeyance until the advent of that far-seeing Scotsman, Robert Williams, head of Tanganyika Concessions, whose energy had already been the means of the discovery and development of the vast riches of the Katanga.

The vision of Williams reached far beyond provincial boundaries. His ambitions were fired with the same greatness as those of Cecil Rhodes and the other great nation-builders of Africa, and through this driving force, the Benguela Railway was eventually launched as another great adventure.

After the death of Rhodes, his mantle fell on Williams, who promised that the scheme of railway development would

be continued, and fully carried out his promise. He was possibly the last man in Africa of sufficient stature to conceive grand projects, and carry them out by personal drive and force of will.

In 1890 Cecil Rhodes had hopes of mineral wealth in Rhodesia, and asked Robert Williams if he would report on the country's mineral prospects. He agreed, and formed the Zambesia Exploring Company to finance the expedition. He himself led the party, starting in March 1891. The existence of minerals was proved, but Williams advised that to make them pay, a shorter and more economic route would be required than the line to Bulawayo from the south. He suggested that it would be preferable to use Beira as a port. Rhodes called in Williams again in 1895, when the discovery of minerals in Northern Rhodesia would have been an important factor in the extension of his railway northwards. An expedition was organised, but as nothing of sufficient value was found, operations were stopped and no more was done until 1898, when once more, at Rhodes' request, Williams agreed to make a final effort.

He sent out an expedition in 1899 under the leadership of the late Mr. George Grey (brother of Sir Edward Grey, afterwards Viscount Grey of Fallodon), with instructions to prospect as close to the Congo State frontier as possible. He believed that the great divide between the Congo and the Zambesi Rivers would be rich in minerals in the same way as the Witwatersrand further south, which forms the watershed between the basins of the Limpopo and Orange Rivers. His belief was correct, for this expedition discovered the Kansanshi Copper Mine in Rhodesia, six miles south of the Belgian Congo—and on the divide. Meanwhile, Williams approached King Leopold and succeeded in obtaining the sole prospecting rights for minerals over 60,000 square miles of the Katanga district in the Congo State, adjoining Northern Rhodesia. King Leopold was convinced that no economic mineral would be found in his country. There were certain old native workings of copper which had been the subject of comment by Livingstone, Cameron and Stanley, and later

by the Portuguese explorers, who had actually visited and described them; but these had been examined by the well-known Belgian geologist, Professor Cornet, whose report was unfavourable, and so no effort had been made to look further.

Then, to quote Williams himself, "Where angels feared to tread, I came along." He was shown Professor Cornet's report (hitherto unpublished) which in his opinion applied solely to the holes and débris left behind by the old workers, and he believed that nothing had been done to test *what was under those holes*. Instructions were sent to George Grey to take his party into the Katanga District and prospect within the area covered by the concession. The party left with this object in view in the early part of 1901, and in a very short time located the ancient copper-workings and many other deposits including copper, gold, tin and diamonds. By 1902 they had opened up and proved the existence of a great copper belt extending in length over 250 miles of country. At the time that these wonderful copper deposits in the Congo were discovered, it was Rhodes' intention to take his Cape-to-Cairo railway to the southern end of Lake Tanganyika and utilise that waterway as an alternative on the main route to the north. Since the earlier agreement reached in 1899, however, Germany had mapped out a Mittel-Afrikascheme, and now refused to recognise the cession of the Congo territory between Lake Tanganyika and Lake Kivu granted to England by King Leopold to carry the railway forward.

Germany's action having rendered Rhodes' plan abortive, he then endeavoured to get permission from King Leopold to run his line through the Congo State, but failed. Rhodes then suggested to Robert Williams that as he had been successful in his negotiations with King Leopold over the mineral concession, he should now approach the King with a view to securing the right to build the Cape-to-Cairo Railway through the Congo State to the Nile. Williams agreed subject to certain conditions, which included a guarantee from the Chartered Company of Rhodesia that they would extend their railway to the Congo Frontier. His interview with King Leopold was successful, and he obtained the

desired concession. Unfortunately it was never ratified. The scheme fell through owing to the extravagant share in the mineral rights of Katanga demanded by financial backers of the Rhodesian Railways in the South as the price of bringing the line forward to the Congo frontier.

Shortly after this, Cecil Rhodes died, and there seemed little prospect of the railway reaching the Congo border for many years to come. By now the existence of great copper deposits in the Katanga district had been definitely proved, and although Williams was anxious for this discovery to assist in the extension of the main line northwards from Bulawayo (as in fact it ultimately did) he realised that if this vast and wealthy zone was to be properly developed, it must have rail connection with the seaboard by the most direct route. He therefore studied the map of Africa and saw that the shortest route to the sea lay along the same great Congo-Zambesi divide on which the minerals had been discovered. He realised instinctively that the economic route from Katanga to the Coast must lie along the ancient trade route, and that this route, with its seaport at Lobito Bay, was nearer by about 3,000 miles to England than any other.

On 28th November, 1902, Robert Williams obtained from the Portuguese Government a concession which gave him the right to construct and work a railway through Angola from Lobito Bay to the eastern frontier of the province, approaching at its eastern terminus on the frontier, the 12th latitude south. Probably no line ever built in the history of the world has stretched so far to such a distant goal, and passed through country with so little prospect of remunerative revenue on its way. The distance from the starting point to the spot where the first mines were being developed was 1,300 miles.

International intrigues, difficulties of finance and construction, interference by politicians in the South; these, together with the outbreak of the first World War, and other factors, all conspired to delay the completion of the project. There were times when the consummation of this great undertaking seemed a prospect of the very remote future, and it

was only by the determination and energy of Robert Williams that the obstacles were finally overcome.

The following dates of completion of the various sections of the line will serve to show the extent of the delays:

	<i>Kil.</i>	<i>Miles</i>	<i>Date</i>
Lobito—Catumbella	14	9	1905
Catumbella—Benguela	36	22	1906
Benguela—Cubal	197	123	1908
Cubal—Cuma	320	199	1910
Cuma—Lepi	360	223	1911
Lepi—Huambo	426	264	1912
Huambo—Chinguar	520	323	1913
Chinguar—Silva Porto	627	413	1924
Silva Porto—Camacupa	702	435	1925
Camacupa—Luacano (Old Frontier)	1,243	770	1927
Luacano—Luo (New Frontier) ...	1,346	835	1928

According to the terms of the concession, the concessionaire, Robert Williams, was to form immediately a limited company to be constituted in accordance with Portuguese law, and construction was to begin on 1st March, 1903. As, however, the Company had not yet been formed by that date, a private limited contract was made with the firm of George Pauling & Co. to begin the work. They started by shipping a small quantity of permanent-way materials—some 1,200 tons—to Benguela, and commencing the earthworks between Benguela and Catumbella. They were also responsible for the construction of the rail-and-road bridge over the Catumbella River, a single trussed girder of 76 metres (250 feet), which was then one of the longest single spans in Southern Africa. Due to financial difficulties, no definite contract followed with Pauling & Co., and the work was stopped in August 1903. Messrs. Norton Griffiths & Co. offered to continue and this firm completed part of the first section of the line, laying the rails as far as Cubal, a distance of 197 kilometres (123 miles), but left Angola in June, 1908. Most of the permanent bridges, ballasting, etc., still remained to be done

in the latter half of the section, which was then taken over and completed by the engineering staff of the railway. From Cubal to the new Angola-Congo border at Luao River, a distance of 1,346 kilometres or 835 miles, the work was once more entrusted to Messrs. Pauling & Co., who started again in January 1910.

At the date of the concession, Lobito Bay had never been utilised as a port. The sand spit on the bay was a desert, with some six miles of mangrove and flats between it and the nearest township of Catumbella, which was situated on the right bank of the river of that name. Before the advent of the broader gauge, a narrow-gauge line, which ran beside the road, connected Catumbella with Benguela, fifteen and a half miles away. Benguela, one of the oldest towns on the coast of Africa, was then the port of Caconda, the most important inland town, some hundred and fifty miles to the south-east. When work began on the inland railway, the line was re-laid between Benguela and Lobito, and Lobito was then developed for the first time as a port.

Under the concession, the Benguela railway was committed to the route already surveyed by the Portuguese Government as far as Caconda, and the original surveys were considered as approved. The original line was intended to run from Benguela to Caconda, but eventually Lobito Bay and Katanga became respectively the terminus and the objective. Being thus committed added greatly to the costs and difficulties of construction. The direction was distorted, several mountain ranges without any natural route for a railway had to be climbed, and the line ran through an extremely rough and waterless region.

Under the conditions of the concession, there was no alternative. It was not until after the first World War that I made a reconnaissance survey directly from Lobito to Cubal, over the high ground behind Lobito and along the valleys of the Catumbella and Cubal Rivers. This would have reduced the line by some thirty miles, and also eliminated the rack section, the heavy gradients, and the troublesome water shortage on the original line, which was then complete for a

distance of 300 miles. A definite survey was subsequently made; but such a large scale deviation will not be considered until it is justified by very heavy traffic.

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Although the concession was actually granted in 1902, and the preliminary work was begun in 1903, it was not until August 1904 that the first definite contract was arranged. At this period, the Norton-Griffiths Group undertook to finance and construct the first heavy section of 150 kilometres called for under the terms of the concession. By the time negotiations were completed, barely eighteen months were left to complete this section, in which many unprecedented difficulties had to be overcome.

Here the line passes through a zone which may be described as a "divide" between the rainy season of the South-Benguela Colony, where the average rainfall is sometimes less than ten inches in a year, and the rainy season of the plateau, in which there may be fifty to sixty inches in a year. The rainfall in this neutral zone was unknown, and the little rain that fell had a quick run-off, as the rocky country could not hold it. Boreholes and wells were sunk in any likely places, but where water was found, it was so highly impregnated with minerals and salts as to be useless for practical purposes.

There were some 7,000 Africans employed on the work in this section. As there was no local labour available, they had to be imported from other countries. The range was wide, and included West Coast Africans from British territories, Senegalese from French West Africa, and 2,000 Indians and their families from Natal. The problem in this heavy, rocky section was how to find sufficient sweet water to keep the labour force continually supplied during the eighteen months which we had to save the concession, and also to serve the locomotives, and constructional purposes generally.

The only sweet water to be found then was in the vicinity of Benguela and the coastal plains. This meant that trains carrying nothing but water were in constant use between the

supply source and the railhead. Because of the rack section, only a few trucks could be drawn on each train. Camels were hurriedly purchased and shipped from North Africa, and every possible form of transport was pressed into service over the first three-thousand-foot summit, where wheeled transport was of no practical use in following the alignment on the mountain sides. The water ration on the works was cut to a minimum. It included water used for rock drilling and other constructional purposes, and was barely sufficient in that hot, dry country. The camels and other animal transport were used mostly for masonry and constructional work. The heavy earthworks, mostly rock, were served by the more flexible system of native carriers. Their load on the rocky hills was an anchorette—a wooden barrel that had originally contained four and a half gallons of wine. In effect, one native was employed solely in carrying water for every native actually engaged on the works.

On one occasion, a water train was derailed, and blocked the rack section for several days. The works ahead had to be stopped, and the greater part of the labour force trekked on to some mineral springs twenty miles away, where work was carried on until the water system was in action again. These mineral springs had beneficial effects, judging from the cattle of the wandering tribes who occasionally frequented them. Their herds were always in good condition, with coats as glossy as if they had been groomed.

As in most cases of pioneer work, where hitherto-untouched country was being penetrated, every conceivable form of tropical sickness was encountered. Beri-beri and sleeping sickness were rife, while the white men were constantly down with malaria. This taxed to the utmost the combined efforts of a medical staff recommended by the Tropical School of Medicine, which was then under the direction of Sir Patrick Manson, the man who did more than any other to combat these scourges of Africa.

The concession required that the rails should reach Katengue, a distance of 122 kilometres, in ten months. Heroic efforts had to be made, and all our ingenuity exercised, in

order to achieve this. From Lobito and Benguela, over the coastal plains, the work was easy, as far inland as ten miles from Benguela, where the country rose abruptly. Here the original alignment entered the Lengue River gorge, whose sides are precipitous cliffs. It was soon evident that there was no earthly chance of complying with the terms of the concession if ordinary methods were used through the gorge and on the grading ahead up to the first range of 3,000 feet. The only possibility was to employ a rack system to the top of the gorge, and this suggestion was cabled home.

Sir Douglas Fox and Sir Charles Metcalfe, the consulting engineers in London, immediately complied with the proposal. This entailed a first half-mile of $2\frac{1}{2}\%$ grade and then two and a half miles of rack railway of the Riggerbach system. For this, engines and material had to be ordered from Germany. The grade was 6% , and after that it continued at $2\frac{1}{2}\%$ with hundred-metre curves to the top of the first summit. In the rack ascent, the gorge was crossed three times with viaducts varying in length from 140 to 300 feet. (Nearly forty years later, this rack section was replaced by an alignment on a $2\frac{1}{2}\%$ grade, which entailed a lengthening of the line with heavy works in that rocky country.)

After the rack section had been approved, a special Union-Castle ship was sent from Cape Town to Lobito Bay with a large number of expert rock drillers, and special equipment, on board. These drillers had to hew the bed on which the rack was laid out of the solid granite of the steep mountainsides. It may be of interest to note the effort made from London after the signing of the contract. The first engine was completed and delivered on board within twenty days of the date of the order. Mr. Dudley Docker, then the head of the Metropolitan Carriage Works, lent his aid, and two hundred trucks were also shipped in a like period, together with rails and crossings. The whole trade of England, connected with railway construction, was pressed into cooperation with what seemed to be an almost impossible undertaking.

Why all the hurry? It was because at that moment there



GENERAL SIR JOACHIM JOSÉ MACHADO, K.C.M.G.

The distinguished Portuguese patriot and administrator, whose name and work are perpetuated in both Portuguese East, and Portuguese West Africa.

was a big German effort in Lisbon to get the concession cancelled if its conditions were not complied with. Not only then, but up until the outbreak of the first World War, Germany was making a determined attempt to gain a footing in Angola as part of her great Mittel-Afrika scheme. In 1912, while the construction was proceeding, and the rail-head was nearly 180 miles inland, a party of German engineers came up from South-West Africa to visit the line. I was then acting Chief Resident Engineer, and a couple of the visitors stayed with me, while two others stayed with Paulings', the contractors.

As they were interested in the type of construction, they were given all reasonable facilities for visiting the works, on which they seemed very well informed. They were especially interested in the possibilities (which we knew of) of a connection between their own line, from its northern extension at Tsumeb, and a point on the Benguela Railway near Kil. 480, which would follow the watershed of the Cunene River, and that of the Cubango River which flowed into Lake Ngami. Along this route it would be possible to build a line for some 680 miles, of an extremely light nature with regard to earth-works, and without the necessity of constructing a single bridge of any consequence.

They also asked if they could have a general plan of the Benguela Railway, but I was naturally unable to grant this request. They were extremely charming, and told me more or less in confidence how much they regretted that I might be out of a job later, as they, or rather their Government, were going to take over the railway for a sum of thirty million marks—an arrangement which seemed to be known only to themselves.

After they returned to South-West Africa, a number of our best trained plate-laying boys as well as a couple of my houseboys applied for leave. This was granted, and they departed—as we afterwards discovered, for South-West Africa, on the inducement of better prospects.

When war broke out in 1914, there were a number of Germans in the various districts of Angola, as prospectors, scientists, or under other guises, who were all interned by

the Portuguese Government; while along the route of the suggested railway from the south were found dumps of materials, provisions, etc., which had been laid up in advance. It will be seen, therefore, that Robert Williams and his colleagues had to contend with political complications in addition to difficulties of finance, and the physical features of the country.

Then there was the serious business of discharging all the material at the seaboard end of the line. The Admiralty charts showed deep water on the inner side of the sand spit which forms Lobito Bay. The Bay owes its constant depth of water to the strong circular current which enters it on the rocky landward side, and flows out along the sand spit. At that time, with the exception of a few huts occupied by native fishermen, there was no other habitation nearer than Catumbella, ten miles away.

A special ship was chartered, big enough to take five Thames barges. Being too heavy for the ship's derricks, these barges were lashed on deck, together with 40-foot baulks of heavy timber. During the passage out, carpenters temporarily strutted the insides of the barges, which were covered over and caulked, so that on arrival at Lobito Bay they could be safely thrown or slipped overboard. This was done by jacking them up with hydraulic jacks, shipped for the purpose, so that the baulks protruded over the side of the ship, until they began to slip of their own accord, ultimately diving into the deep water of the Bay. Four of these came up again, while one failed to surface. These four were anchored out from the steep side of the spit, which slopes at an angle of one in five, and connected with baulks, until two temporary gangways were thus available, forward and aft of the ship.

As the rails were landed, they were laid on the sand spit, which was the start of the ocean terminus of the Benguela Railway. As soon as timber was available, the temporary landing stage of barges was superseded by a timber wharf, which, with an approach of sharp curvature, was built parallel to the spit in 40 feet of water.

Within a day or two of the time specified in the concession

for the rails to reach Katengue, the first engine arrived there, and also incidentally reached the first pools of water encountered during the entire journey from the coast. That water, although crystal clear, was the cause of another great disappointment. A few days after the engine had begun to use it, it went out of action owing to heavy incrustation of the boiler tubes caused by the high mineral content of the water. This meant that fresh water had still to be hauled over the first 3,000 feet summit, down the drop of 1,500 feet into the bottom of the Katengue Valley, and then over another climb of 1,000 feet. Beyond this, in a dry, sandy river-bed, we found the first sweet water—but there was very little of that too.

At this period, Sir Charles Metcalfe came on more than one occasion to co-operate with exceptional energy in what he described as one of the most difficult engineering feats undertaken in the history of railway-building in any part of the world—the surmounting of this great African divide. 150 kilometres had to be covered in eighteen months, with no water, hard granite gorges, and other obstacles to contend with.

In the Lengue River gorge, where the rack section was situated, work was carried on night and day. Electric lights were suspended on cables slung across the gorge for night work, forming a weird illumination for the swarms of natives working on the rock faces of the gorge. These electric lights were hauled along the cables to a safe distance before the charges were fired. Gangs worked in continuous shifts throughout the twenty-four hours, until the top of the rack section was reached.

While this work was in progress, a reconnaissance was undertaken of the first proposed route the railway would take from Caconda to Katanga, passing through Dimbucho, Bihe, Moximco, and Nanakandundo. From this point the railway was to run parallel to, but outside, the southern boundary of Northern Rhodesia, to join the Belgian Congo frontier at a point on latitude twelve degrees south.

In 1908, however, when construction was well in hand,

this objective was altered, and it was agreed between the parties concerned that the Benguela Railway should meet the Katanga Railway at a point represented by longitude 21 degrees 39 min. east, and latitude 11 degrees 12 min. south. Some years later, when the Angola-Congo border was definitely beacons, this point was approximately fixed by Boundary Beacon No. 34.

The direction of the line was therefore diverted, near Kil. 151, from the original route to a more easterly one, but from this point there was no deviation in its direction, which became fixed as the shortest route to Boundary Beacon No. 34. Thanks, however, to its commitment to the Benguela-Caconda route laid down originally by the Portuguese Government, the railway will always carry an initial handicap in the way of heavy grades and sharp curvature until such time as it is expedient to deviate it to the alignment I have mentioned, direct from Lobito terminus, with a gradual ascent of lighter grades and curvature along the valleys of the Catumbella and Cubal Rivers.

I made my first connection with the Benguela Railway in Angola when I arrived at Lobito Bay in the Union Castle cargo ship *Alnwick Castle*, which was carrying railway material and stores. The line was then near the top of the rack section at Kil. 52, or thirty miles from Lobito. Mr. E. R. Robins was then Chief Resident Engineer, but left shortly after on leave for England, leaving Mr. E. E. Homer to act in his place. Homer had recently done good service as chief of survey, deviating and reducing some of the heavier sections of the line which had been the legacy of the original Government plans. My work was Chief Assistant Engineer on supervision of construction, and a very interesting job it proved to be in that rough, dry country, with so many novel features to be countered.

In that type of country it was only possible to travel on foot, or occasionally by pony; transport was mainly of the former variety, and so we kept well exercised. I made my first main camp, with minor camps below, near the first summit, at Kil. 85, or fifty-two miles from Lobito. In normal

weather conditions, we could see the sea from there, lying to the west. I imagine this was one of the few railways in the world where it was possible to view the sea from such a height and such a distance.

Our "mixed bag" of labour was a serious handicap in the race to save the concession. As already mentioned, there were very few local Africans on the works to begin with. The indigenous tribes consisted of just a few nomads, who wandered among the rare water holes in that desert country with their cattle and their goats. Of the workers imported by Griffiths & Co., there were Kroom boys from British West Africa and Senegalese from French West Africa who were all good workers, but the Indians brought from Natal were not much good on the job, and were more of a nuisance than a help. They brought their wives and families with them, and had to have special food imported for their benefit. After leaving the fertile country of Natal, they were sorely tried by the lack of water, which had to be strictly rationed. Sickness broke out among them, and many died before they could be repatriated to Natal. The Senegalese, who were from fighting stock and not well broken in to manual labour, worked harder, but gave trouble at times and were prone to riot.

It was only after the most difficult sections had been surmounted and the line was well into the better-watered country, some two hundred miles inland, that we found suitable and sufficient labour. The type of work was foreign to them, as most of them were carriers by profession, transporting rubber and wax from the far interior. When eventually they got accustomed to it, they made good workers, and the supply was constant. In the earlier days, those employed on the works were ex-porters who had come from up-country with loads, and were used mainly to carry water from the railhead to the works. They were good at this, as they could manage loads up to eighty pounds at times, but were quite useless for manual work with pick and shovel. It was not until 1908 that the labour situation permitted the repatriation of the importees.

The Company's engineers, with the approval of the Portu-

guese Government, were working ahead of the contractors, making local deviations, and lightening the work on the original survey. A few months after my arrival, I had been up to visit the survey party, which was then working 240 kilometres (150 miles) inland. On my way back, I camped for a day on the Cubal River, after buffalo. It was in that camp that I experienced one of those unaccountable mysteries of Africa, for which there seems to be no normal explanation. The psychic occurs in Africa not only among the unsophisticated, but also among those who have been exposed to the influences of civilisation. I am by nature prosaic, and by nature of my profession a materialist, but in the course of my travels I have on several occasions had cause to wonder.

This particular incident concerned myself and a half-educated African, whom I questioned over a period of several months, but from whom I received no satisfactory answer to the puzzle.

During my time in Rhodesia, I had had a personal boy whose home was in Portuguese territory on the lower Zambesi. He was no longer young, and had left me to return to his own country on account of his health. I had returned to camp on the Cubal River after my day's shooting, when two Africans, very thin and weak, and wearing only the scantiest of clothing, entered the camp. There were no local natives within miles, and anyway the few in that district would have belonged to a nomad tribe, so I was astonished to find myself addressed in "Kitchen Kaffir", the free language of Rhodesia and East Africa.

"Don't you know me?" came the first question, to which I replied, "I don't—but you speak the language of the other side of Africa."

"I am Antonio," said the elder bag of skin and bones—and even then I could not recognise him as my smart-looking boy of former days, nor believe in his identity. His companion had been my kitchen piccanin, whose home was in the same country, and Antonio had collected him as a fellow-traveller on his odyssey. Their appearance on the other side of the continent was little short of a miracle.

The first necessity for them was a square meal, and plenty of meat, which they had not seen for a long time. I then tried to find out how they had come so far from their own country, passing through so many strange territories on the way, among them the dreaded "Hungry Country" which was the region that had reduced them to their present state. I asked Antonio how he knew I was in Angola, why he had come, and when he had started, and what had brought him into my very camp. To all my queries, then and at later dates, I could only get the unvarying answer: "My heart told me so."

I tried to get some more practical reply from him, and said:

"That is the answer of a M'tumbo [raw native,] and not a man like yourself, who has lived among white people for so long, and knows their way of thinking."

But his explanation never varied. From what I could gather, he had started from his home on the Lower Zambesi, where he could not possibly have received any news of me, at about the same time that I decided in London to choose Angola instead of South America for my next job. He told me he had not known where I was, and could not find out, but he knew that if he started he would eventually get to me. He confided this "hunch" to Jim, and persuaded him to accompany him, not knowing that the hunch would cost him three months of weary travelling. On the journey they parted with all their belongings, including their clothing, in exchange for the bare necessities of living. Antonio remained with me for some time, but never really recovered from his arduous trek; so eventually, when the opportunity occurred, I sent him back by ship to his home on the other side of the continent.

On several occasions during my travels in the untouched parts of raw Africa, I, like others, have experienced the workings of the "bush telegraph", that strangely accurate method of sending news over vast distances without the use of any apparent means of communication. The case of Antonio was even more mysterious, and like the bush telegraph, remains an unsolved problem. His survival through the rigours of the "Hungry Country" was in itself a marvel.

The Kohemba River, which runs to the east of the Quanza River, can be considered as the western boundary of this "Hungry Country", which was known and dreaded in the days of native-carrier transport, before the advent of the motor car and the railway. This territory extended nearly 300 kilometres to the east. Throughout, there were no inhabitants, and therefore no food to be obtained en route. In traversing it, extra carriers and foodstuffs sufficient for the whole distance had to be provided. The urgent need for this precaution was brought home to me when I trekked it in 1920. I took fifteen days to cover the distance, arriving on the eastern side with one day's food for fifty carriers in hand.

The country is broken, without definite hills, but with sandy ridges, sloping steeply, which are covered with thick scrub and undergrowth. Curiously enough, it is well watered, but nothing edible will grow.

Stray parties of the Vachokwe, a large and truculent tribe living on the borders of this country, used to waylay and rob the native caravans bearing rubber and wax on their way from the east to the coast. Eventually they took to attacking wagon transport as well, until the Portuguese authorities sent in a punitive expedition in 1910, which put a stop to their activities.

These people are a branch of the same tribe complained of by Livingstone when he passed through their country further to the north on his first travels to the west coast of Africa.

Occasionally, Africans carrying commercial loads for their own profit, under-estimated their food supplies in crossing the "Hungry Country", with fatal consequences. In those days, many skeletons marked the paths. Rail and road transport has now eliminated the chance of these disasters, as it has in the case of the "Thirst Country" near the coast.

After the initial rush to reach the objective in time to fulfil the conditions of the concession, matters became easier. Except for a little trouble with the Senegalese labour, which was soon settled, work continued at a normal tempo. After the second summit was surmounted, and the difficult section passed, good progress was made. At Kil. 160, a hundred

miles from the coast, the first sweet water was reached in the River Kaimbambo, which only ran in the wet season, but still contained sufficient in the dry to ease our previous difficulties. With the lighter formation, it was possible to speed the plate-laying, which was done with all the materials on hand till a point was reached at Kil. 210, or a hundred and thirty miles from Lobito.

With the exception of the bridge, at Kil. 200, over the Cubal River (the first constantly running river), no permanent bridges were built in the preceding ninety miles. All openings for the plate-laying were bridged by cribs, trestles, and other temporary erections; there were some sixty of these, ranging from small culverts to spans of fifty feet.

The line as it was then, on the new alignment, with its terminus in unknown bush, served no practical purpose for what little through traffic there was. Transport to the only centres of any importance—Caconda to the south and Bailundu to the north—was still undertaken by ox-wagons and native carriers. That was the position when, on 20th June, 1908, the contractors, Griffiths & Co., decided, for financial reasons, to relinquish the contract, and accordingly left with their staff on a Union-Castle ship which put into Lobito specially to take them back to England. Mr. Robins, the Chief Resident Engineer, also decided to leave for England, and I was detailed to take over from the contractors in order to complete the unfinished work, and supervise the maintenance of the line already built.

There was a plentiful supply of material for the work, and a certain number of sub-contractors and their labour had remained in the country, but there was no financial backing to pay for this labour, and there seemed to be little prospect at the time of any being found. If all the temporary works were to be saved, it was necessary to get busy before the approaching wet season.

At that time, the Portuguese representative of the Company in Angola was Marianno Machado, brother of General Sir Joachim Machado, the managing director in Lisbon. Marianno Machado was a very able director, who had had much

previous experience in Moçambique, and was now general manager of the line as it stood. I was the sole representative of the Company's engineering staff left in the country. M. Machado found that there was quite a considerable sum due to the Company in rebates on customs duties which had originally been overpaid, and he proposed to use this for the completion of the works.

We agreed that I should take over the line from Benguela for this completion, and should run one train a week, which proved sufficient at the time to deal with the existing volume of traffic and passengers. I accordingly made a construction camp at Kil. 156, as the most convenient point, and collected materials and labour there for the work. I had no technical assistant, nor was there such a thing to be had, but I had one general assistant, who went by the name of "Long Brown", and very competent he proved to be. He was of much the same type as Jimmy Lawther, who had been such a help to me on the Pungwe works.

Long Brown came of a very well-known hunting family in Warwickshire. He stood six feet five inches in height, and was the living image of the late Lord Kitchener—so much so that once, when we were together in London, the policeman on traffic control at the Mansion House stopped the traffic for him, and saluted. Brown gravely returned the salute, with a dignified "Thank you, officer." This likeness drew attention to him on many occasions and in many places.

With all our efforts, we were unable to save all the temporary openings before the rains broke, as that year they came early, and were exceptionally severe. But as there was so little traffic, this did not matter, except for the loss of material which could not be replaced.

It was during this period that Major Boyd-Cunninghame returned from his second ox-wagon trek to the copper-belt in Katanga. Boyd-Cunninghame, who now lies buried at Elisabethville, was one of the well-known sportsmen of his day, and a senior member of the Cunninghame clan. He was a scratch player at golf, a first-class shot, a county cricketer, and had a high handicap at polo. He had been commissioned

in the first place by Robert Williams to lead an ox-wagon expedition from the west coast of Angola, to take in trade goods, and to bring out the first copper from the Katanga. He embarked on his first trip in 1904. This entailed cutting six hundred miles of road for his eighteen ox-wagons from Moxico, a Portuguese centre six hundred miles inland, which was then the terminus of the wagon road, and the furthest point of penetration to date. He was brought to a stop in Katanga when he encountered tsetse fly near Ruwe.

On this first trip he was away for eighteen months altogether, and returned with twenty tons of copper to Benguela before the railway had begun its progress inland from there. On his second trip, he arrived on the line seven miles from the camp I had recently formed, again with twenty tons of copper.

My camp was situated at the foot of the Sapa mountain, in a country which was mostly thick thorn-bush studded with granite kopjes and boulders—ideal places for leopards and lions—and scattered with patches of forest and open glades. On the afternoon of his arrival, Boyd-Cunninghame walked over to my camp to arrange for the transport of his copper by train to the coast. He remarked that he had seen a likely place for lion at a small kopje a mile or so back from the camp, and that he had observed fresh spoor in the vicinity; I told him that lion had stampeded a herd of zebra past the camp in that direction the previous night.

For his return, I mounted him on a grey pony of mine, and went off with him to see his camp, and also to bring the pony back. On my way back, late in the afternoon, when we reached the spot on the path that he had mentioned, the dogs, who were ranging ahead, suddenly shot out of the bush on to the track and bolted for camp. My pony evidently winded something too, and took fright. The grey that I was leading, unfortunately with the rawhide riem twisted around my right hand, took no interest in the adventure, and if my bridle had not held, I should have been pulled backwards out of the saddle. I tried to loose the grey, but the riem tightened steadily.

Then I saw the lioness. She came out of the bush onto the path and started to follow us. She was evidently lying up with cubs, and welcomed this wonderful chance of meat so close to her lair, to be had without the effort of hunting. The grey then realised our danger. It plunged, and shot forward with my hand still firmly fixed in the riem, almost tearing my arm from its socket, as we headed in a frenzied race for home. I cannot remember how we got through that narrow trail in the patch of forest, linked so painfully together, but we arrived safely in a muck sweat at the camp beyond. Here we were met by Long Brown, whose greeting was a caustic comment on my bringing the ponies back in such a poor way at the end of the day. The animals were in his charge, and were his cherished pets. I suggested that as he was such an animal lover, there was a very fine lioness behind which he might care to look after as well.

We went back with rifles, and found that she had only broken off the chase a few hundred yards from the camp, but we were unsuccessful in tracking her down. My hand was out of action for several days afterwards, with the twisting it had received from the riem during our flight.

The bush around the camp was full of leopards as well, which could be heard but not seen in that type of country. They got several of my dogs, but quite a number were trapped—the best way of disposing of them. There were also plenty of wild dogs in that district. Their curious hunting call could be heard quite close to the camp as they ranged across the valley before packing for the final kill. When they were in the district, the natives maintained that the lions went elsewhere, and as far as we could check up on this belief, it appeared to be correct.

One day the wild dogs ran a kudu bull through the centre of the camp while Long Brown was there. Unfortunately I was away at the time. He gave me a vivid description of their attack on the wretched animal, tearing at its sides in the pursuit, while the camp boys took to the trees for safety. They finally pulled it down just beyond the camp. Wild dogs are the cruellest of all hunting animals, as they do not kill cleanly,

but with the utmost savagery, tearing at the flanks and tender parts of the hunted animal before it falls, and devouring it before it is completely dead. In this particular case, most of the meat was collected by the boys in the camp after they had driven the dogs off the kill. It is a superstition that some meat must be left for the pack, as in the case of leaving honey for the honey-bird after it has led one to the hive.

Personally, I never had any compunction in shooting up a pack of wild dogs, even if it meant fouling a clean rifle and having to clean it again oneself—which I always did. There was always the satisfactory outcome of dog eating dog—this being their invariable custom with a wounded comrade. Once I was not far behind a pack which was coursing a pig. By the spoor it had met another pack coming in the opposite direction. Evidently the pig had got away, but by the signs on the ground, there must have been a great fight between the rival packs. These dogs have no fear whatever. Although they came close to the camp at times, they never troubled either humans or domestic dogs; in fact, although I heard of cases of their attacking human beings, I was never able to trace an authentic instance. They are beautiful movers, as light as air, and when they hunt, running mute as a rule, one could cover them with the proverbial tablecloth. I never cared for them, however, and my dislike generally took a practical turn whenever I had the chance to express it.

When Boyd-Cunninghame left for England, he left me a legacy in the shape of "Jock". Now every race, whether human or animal, includes a certain percentage of thugs, and it is not to be supposed that the monkey world is any exception. Jock was a living proof of this. He was an arch thug among monkeys, and in addition, he was common. Only his ignorance of social distinctions prevented him from being aware of how common he really was. When he became attached to me for discipline and rations—principally the latter—he had completed nearly three thousand miles with the ox-wagons to Central Africa and back, gaining on the way a complete knowledge of men and animals and their ways. He was

absolutely fearless of both. When on his hind legs, with both arms fully extended—a characteristic attitude adopted to inspire fear in others—he measured about fifteen inches each way. In that position, he gave way neither to man, dog, nor beast; in fact at times when an ox was too near to the camp, he would advance on it, chattering as he went, until the intimidated creature, gigantic in comparison, would back diffidently away. There was only one thing he really feared, and that, curiously enough, was his own people. On occasion a troop of monkeys would pass through the trees near camp, and then Jock would instantly lose all his conceit and bolt for cover, under a bed or any shelter where he was hidden from view. There he would abjectly remain until they disappeared.

On his travels he had been free to roam as he pleased on the wagons. In the course of his long treks, he had lost half of one ear, and about the same amount of his tail, which did not improve his already disreputable appearance. He took charge of all the camp dogs, large and small, to the total number of six, as well as a couple of small, tame buck, all of whom used to run together, and feed out of the same dishes. Sometimes there was an episode that was considered somewhat over the odds, such as distributing all the matches and biting off their ends, or playing the same fascinating trick on the lead pencils. Then Jock would be attached to his post by way of discipline. His gang would lie around him until he was released, while he chattered his disapproval, and de-flead those close by to pass the time. An unpleasant habit of his was to sit innocently by while one was shaving, then suddenly grab the lathered shaving paper and make off with it, chattering and consuming as much of the soap as he could before he was caught.

One day, we thought Jock's end had come. Bessie, a big powerful bitch that I used for hunting, had produced a litter of two pups, of which she was excessively proud. In her maternal obsession, she spent most of her spare time chasing her erstwhile friends out of the camp. Her pups lived in a large, square wooden box with sides six inches high, which was placed in the corner of one of the "bandas" or grass huts

of the camp. She was just returning from one of her punitive expeditions when I saw Jock sitting on the edge of her box, holding up at arm's length and examining one of the pups. It seemed that his end must come before I could reach him to rescue him from the avenging mother. As she approached, he took no notice of her at all, but proceeded to lay the one pup down and lift the other for a similar searching examination. Then an amazing thing happened. Bessie sat meekly down, surprised, doubtful, and finally flattered and pleased. From that time onwards, he practically reared the pups himself, and they were inseparable until his untimely death.

This was a tragic little accident. There was a favourite game, which consisted of the dogs tearing round and round the camp clearing, while Jock would mount, ride and dismount first one and then the other, leaping from back to back rather in the manner of a circus rider. While they were at it one day, Jock decided on a new variation, and dropped from the bough of a tree at the edge of the clearing to join the circle. Not recognising his friend, one of the dogs bit him in the headlong rush, and he died the next day. I was away at the time, and though Long Brown did all he could to save him, his efforts were in vain. He told me that it was one of the saddest sights imaginable, as the dogs all realised what had happened, and hung about disconsolately all day while he was dying.

His funeral would not have disgraced a human being, and was a fitting one for the little warrior that he was. Long Brown assembled all the dogs and camp boys round the grave, and fired a volley over him with all the guns in camp. That camp site, like all our others in Africa, is now overgrown, but should anyone ever stub his toe in that neighbourhood on a block of masonry which would seem to be out of place in the bush, that will be the spot where one of the most amusing and game little heroes of camp life lies buried.

It was at that time that I had my gun-bearer Alexander, who is mentioned at the beginning of this book, and who was with me until I left Angola. He was not only a good hunter, but a great naturalist as well. He had a wide range of knowledge of herbs and their uses, and was an expert in the

“juju” of his native West Coast, whence he had come in the labour force imported by Griffiths & Co. He was one of the few people I have known who could handle live snakes, whether poisonous or not, from pythons downwards. He used to bring these into camp, stating that they were for medicinal purposes, but even in this guise it was a habit I strongly discouraged. He believed that the fat from beneath a python skin—of which there is usually a plentiful supply—when placed on a bullet wound or other injury, would draw the evil to the surface. I never had the opportunity of seeing a proof of this belief. He explained that his immunity from snake-bite was due to the protection of a certain weed, which he chewed and rubbed on his feet and legs—after this treatment the snake “no agree for him”. From actual evidence there seemed to be a certain amount of truth in this statement, whatever the reason, he never seemed to come to any harm through handling his reptiles.

On one occasion, I had sent him down to the elephant country near the coast, to see if the herd were back in their feeding grounds, where they were due at that time of the year, and to report if there were any good ones with ivory among them. When he returned three weeks later with the required information, his only baggage was a bundle in which I noticed slight movement. Knowing my views about bringing snakes into camp, he explained hurriedly that it was a snake which he wanted for medicine, but that he had taken its “teeth” out. On inspection it proved to be an outsize in puff-adders. Whether from the loss of its fangs, or the long confinement rolled up in the bundle, it was not taking very much interest in life.

Alexander laid it out on the ground, and after a little while it began a series of convulsions, eventually producing a rat without a tail, covered with saliva, but otherwise showing no sign of being digested. After another convulsion, another rat appeared, and so on until a procession of four had been off-loaded, stern first and all as fresh as the first one, which showed that they must have been taken at the same time. It was interesting to note that such a sluggish thing as a puff-adder



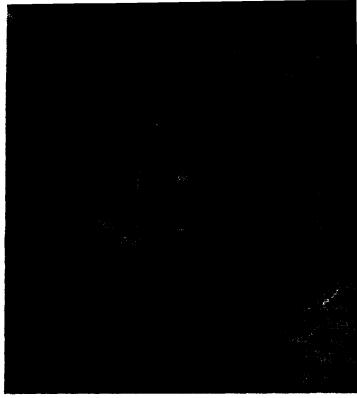
A



Buffalo
Ruindi,
Belgian Congo.



Black rhinoceros
Kenya.



could not only catch, but absorb such a number as this "Pied Piper in reverse".

Alexander's hunting kit was not only extremely simple, but practical as well. It consisted of a single gunny-sack, with a hole for his head, and the corners removed for his arms, tied round the middle with a piece of bush string. The pockets, of which there were three, were formed by turning up six inches of the front edge of the sack. These held odd bits of iron, a small container with some trade powder, and the eternal medicines.

In Angola, natives were then allowed to carry muzzle-loading smooth-bore guns, but no weapons of precision, such as shot-guns or rifles. At the time, the value of a trade gun, which might be an old Tower musket, or a Belgian "gas pipe", was ten shillings. That was the native's only weapon of offense or defense, except of course for the assegai and the knobkerrie. With these guns, there was a distinct hiatus, varying in length, between the fall of the hammer and the eventual explosion, if it occurred. But even hampered by this drawback, Alexander was able to do good execution with his weapon.

His job, when not acting as gun-bearer to me, was to supply the camp with guinea-fowl and bush-fowl, and small buck; but he was not authorised to touch any of the larger game. It was difficult to see that this instruction was complied with, as it was a great temptation to try for bigger game, there being ready markets for the meat elsewhere. Failure to obey meant punishment for him unless there was a very good reason for it. In such a country, an excuse was apt to occur at times. One day, when sent for, he came into camp at his usual pace, which for a true hunter is less than two miles an hour, covered from head to foot with the lung blood of a large animal. I gathered from his account, which I had to accept, that he had been out after some guinea-fowl, when a bull buffalo disputed the right of way along the same bush path, or, as he expressed it, "stopped and sassed him plenty". There was unconscious humour in the description. When one has had a similar experience of this type of most unwelcome

“close-up”, “sassiness” is hardly the word one would choose to express the character of the encounter.

Alexander let the cheeky beast have the whole collection of museum specimens and old iron with which he usually loaded, dropped the gun, and shinned up a near-by tree to await results, while the buffalo succumbed on the ground below. He remained aloft until he heard the buffalo “criap”, which was his description of the loud expiring sigh they usually make as the final breath leaves them. He got down and retrieved his gun, but he had under-estimated the buffalo’s tenacity. There was still life in it, and it rose to its feet, but was too far gone to harm him. In a last throw of its head, it covered him with its life blood—hence the appalling mess he was in on returning to camp.

In this he was luckier than another boy of mine, who against orders did the same sort of thing in the Beira country. Unfortunately for him, the buffalo charged, and crushed his body against the trunk of the tree as he started to climb.

Another incident carried its own punishment. He had been absent for a couple of days before I sent for him, and eventually appeared, dashing up at his usual pace and looking very much the worse for wear. His assistant, a small boy of about fourteen years old, carried what appeared to be a much worn shaving brush, only on a rather larger scale. This was the remains of his gun. He had decided to lie up for a pig at a water-hole one night, and in order to make sure of his quarry he had put a double charge in the gun. It was more than the long-suffering weapon could stand. The pig got away scot free, but Alexander’s marks of combat were a cut face and a shoulder like a leg of mutton. This meant another ten shillings for a new gun, this time an old Tower musket which was better able to withstand such treatment. The old one was cut down below the site of the damage—about half way—and served as second weapon, being carried by the undersized assistant.

Apart from the birds, there was an unusual preponderance of does among the small buck he brought in, and also an occasional leopard. He was permitted to shoot these, as they

were plentiful, but I was interested in the composition of this mixed bag, and one day when he reported a leopard in a certain part of the bush, I went out with him to see for myself how he achieved the mixture. His technique was to stand in a likely clearing and imitate the bleating of a fawn. Mothers usually hide their young near the spot where they are feeding. The effect of Alexander's imitation was to attract the mother back to the young she imagined to be in distress, and occasionally to lure a predatory animal out in search of easy food. This day, after a few calls, one bush-buck ewe and several smaller buck were attracted, but retreated. Then came the leopard, who unfortunately was not deceived, and seeing what it was hastened rapidly back into the bush, without giving us the chance of a shot. After that instructions were given that no more females were to be shot, though no limits were imposed on leopards—nor Queensberry rules.

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The line was duly completed past the Cubal River, and the end of the heavy section of $2\frac{1}{2}\%$ grades was reached. We were ready to continue on lighter grades at such time as the financial arrangements permitted. The original lightly-built timber jetty at Lobito was in a bad state, owing to teredo worm, so this had to be rebuilt and extended ready for the future arrival of larger ships bringing our material. This second wharf served the port for all purposes, both railway and commercial, and was the only means of landing passengers and cargo for nearly thirty years, until the present permanent wharves superseded it.

At this period there was a certain amount of unrest in the inland districts on the borders of Angola and the Belgian Congo, the actual frontiers of which were then undefined. One particularly unpleasant individual operated there over a wide region with a band of followers. They were known as the "revoltees", and had been in the Belgian service, but were said to have killed their superiors and deserted, taking their arms and trekking south. They lived by raiding, marauding, and terrorising the inhabitants of these border districts, and

were active at about the time that Portugal was declared a republic. With this declaration, all slaves in Portuguese territory were declared free. As the main means of livelihood of the revoltees was raiding slaves in the basin of the Casai, this was a serious blow to them.

Their habits were peculiarly unpleasant. It was considered necessary for the chief to have a meal consisting of a human heart every few days, in order to maintain his courage. They had all turned cannibal, and the private parts of their victims would be hung across the paths of villages they had raided in order to mark their progress.

One exploit of the chief's was particularly revolting. He arrived at a trading store owned by a Portuguese who, in that time of undefined frontiers, believed himself to be inside Portuguese territory, but later found that he was on Belgian soil. The revoltee chief brought in twenty-five prisoners as slaves, demanding powder and shot in exchange. The trader refused the demand, and the chief then said he would have to destroy them, as he could neither continue to feed them nor take them on further with him, nor did he intend to leave them behind. Before the trader's incredulous eyes, he cut all their throats at the very door of the store, and departed.

I eventually had this story confirmed by the trader himself while I was in that district. I had heard the story originally from a young assistant whom I had sent up at the time to get some necessary information on the country. This young man was James Chapman, whose father, a son of the famous explorer of that name, was one of the first to trek up from the Cape through South-West Africa and settle in Angola. James, who had been born in the country, knew it thoroughly, and spoke the language well. He was a very useful assistant to me until his death.

After this deplorable episode at the frontier, the Portuguese sent up an expedition which finished off the revoltees and put an end to their activities.

During this time of delay due to financial troubles, Robert Williams negotiated with the firm of Messrs. Erlanger, and came to an agreement with them by which they financed the

subsequent construction, culminating eventually in the completion of the line at the Angola-Belgian Congo frontier in 1928.

The new contractors, Messrs. George Pauling & Co., arrived at Lobito on Christmas Day, 1909, to continue the work. Mr. E. E. Homer of the Benguela Railway engineering staff came out on the same ship as the contractors, with a survey party from England to re-align the original survey with lighter grades and easier curvature between the Cubal and Quanza Rivers, Kil. 725.

The actual work of construction was begun on New Year's Day, 1910. Although very little rock was encountered, this section included heavy earthworks in the final ascent, which ran through the picturesque Lepi Valley to the Central African Plateau. The highest point of the plateau on the line is at Kil. 384—two hundred and eight miles from the coast, at an altitude of 1,852 metres (6,081 feet). The heavier gradients of 2% end at Nova Lisboa, at Kil. 425 (263½ miles). Beyond Silva Porto, there are no engineering difficulties of any consequence, and the line continues through rolling, easy country, along various watersheds on a grade of 1.25%, compensated, until its junction with the lines of the Belgian Congo at the Luao River at Kil. 1,346 (834½ miles), at an altitude of 975 metres (3,198 feet).

When the line reached Chinguar at Kil. 519 (322 miles), in 1914, there was another pause to consider ways and means for the contract, which would have taken the line right through to the Frontier, but for the intervention of the Great War, which entailed the stoppage of the works. A token continuance, to comply with the terms of the concession, was made by advancing the light earthworks at the rate of two kilometres a month, but in the circumstances even this was eventually brought to a halt and the work was shut down with the permission of Government. It was a long time before it recommenced, some considerable period after the end of the War.

I was then Chief Resident Engineer, having succeeded Mr. Robins; I had as my chief assistant Mr. R. A. Duthie, a

cousin of Robert Williams. Early in the war, the Portuguese Government interned the Germans already mentioned as resident in the country; but there was trouble from other sources, which necessitated my remaining on the railway to begin with, anxious though I was to get home and join up.

There was unrest in the Cunhama country, the home of a warlike tribe immediately to the north of German South-West Africa. The disturbance here was part of the scheme of occupying Angola, but the Germans were frustrated by General Botha, who defeated and rounded them up before they had a chance to break through. He was helped in his task by the exceptionally dry season, which played a part in their surrender. There was only sufficient water in the water holes on the long desert trek that year to supply one wagon a day—totally inadequate for the 1,500 Germans and their transport, had they succeeded in eluding Botha. The war situation in Africa might have been considerably altered had such a number managed to break through to the well-watered and fertile plateau of Angola, and the task of the Allies rendered considerably more difficult. As it was, Maritz, South African leader in the Boer rebellion, did manage to get through. He lived during the war at Loanda, where his wife and family joined him.

While this threat existed from the south, all the principal bridges on the line were guarded, particularly the vulnerable viaducts on the rack section. It was only when this situation was settled that I managed to get home to the War. I offered to resign in order to do so, but the Company very kindly gave me leave on half pay.

I duly arrived at the War Office in London, to whom I had sent an application in advance, only to be shown a lengthy waiting list of others anxious to join up, and be told that I was too old. I was then thirty-eight. This was a great disappointment, after the effort I had made and the distance I had travelled.

All was not lost, however. I met an old hunting friend, now a General, who was home on forty-eight hours' leave. He asked me what I intended to do, and when I told him the

nature of my welcome, he said there must be some mistake. He mentioned that he was dining that night with a certain eminent personage, and that he would enlist his aid. He evidently kept his promise, as the next morning, at nine a.m., I received a message at my club to report again at the War Office as soon as possible.

In the same office where I had been refused the day before, I was asked if I could be ready, with uniform, to report again three days later at the Royal Engineers' Depot at Longmoor, where the R.E. railway construction companies were being formed. Ten days later I was in France, attached to the Fourth Army on the Somme on the work of reconnaissance and reporting on possibilities of connecting the railways on our side with those known to exist behind the German lines. This work continued as the advance started and was maintained in the first phase of that period of the War. Combined with the laying out of ammunition depots between the front, and the rear of the lines as far back as Dieppe, it provided me with a most interesting job.

Afterwards I spent some months at the War Office in the Railway Intelligence Service, working up information in that sphere for the advance in Palestine. This ceased on the first setback at Gaza, but I was told later that the information gained, which I arranged as a minute for the General Staff, proved extremely useful in General Allenby's final advance.

The winter of 1917-18, and a very cold one at that, was spent on railway work in the Ypres Salient behind Passchendaele.

When the submarine menace was at its height and our shipping losses were at their most serious, a scheme was suggested to use slower ships and even sailing vessels on the South Atlantic, where the danger from submarines was not so great, to ship nitrates from South America to Lobito Bay and tranship them from there in faster ships to England. Robert Williams had applied to the Army for my release and my return to Lobito, but the application came through at Passchendaele, where at that time I was the only one out of six officers in my company who was not either killed or

wounded. In the circumstances, I asked to be allowed to remain where I was. The second application came through when I was in hospital in Rouen, just before the Armistice. I thus returned to Africa, though with the end of the War the transshipping scheme came to an end as well.

After the war, with the shortage of materials and their increased cost, construction was at a standstill in Africa as in other parts of the world. The railhead was still at Chinguar, at Kil. 520, where it had been in 1914. Earthworks, of a light nature along the sandy watershed of that district, were completed to Silva Porto, Kil. 627 (418 miles), but there were no permanent way materials available for laying the line. Definite detailed surveys were then completed as far as the Quanza River, at Kil. 725 (450 miles), but beyond that point, details of the actual route still remained to be decided.

It was essential to revise the original contract, particularly in view of the rise in price of materials, and to consider the financial position, under post-war conditions, for the final section of the line. This was to end on the old frontier at Luacano (Kil. 1,243; 770 miles), but was subsequently extended to the Luao River, at Kil. 1,346 (835 miles).

Before the details of the final contract could be settled, it was decided that I, together with the representative of Messrs. Paulings, Mr. A. H. Tucker, should go over the route which had eventually been selected. After collecting supplies, and a party of forty carriers, we started off with our separate camps, following the same route but working independently throughout.

To the east of the Quanza River, the nature of the country undergoes a complete change, from the fertile plateau of red soil on the west to a poor, unproductive one of light sand, which continues, with only two small strips of red soil in the whole expanse, as far as the frontier. One of these breaks is at Kohemba, at Kil. 781 (484 miles), where there is a fall in the river of that name. These falls resemble the Victoria Falls in miniature. They are 156 feet in height and 650 feet in width, dropping perpendicularly over black basalt cliffs, and entering a short gorge with all the same trappings of

delicate spray and rainbow colourings. The only stone to be found for 400 miles ahead, in the country on the route of the line, is at Kohemba; this emphasises the sandy nature of the Central African plateau in this region.

The Kohemba, as already stated, is the western boundary of the "Hungry Country". Near Kil. 860, at an altitude of 1,515 metres (4,979 feet), in latitude 12 degrees 13 min. south, longitude 18 degrees 41 min. east approximately, lies the most westerly limit of the Zambesi-Congo watershed. On a rise 100 metres to the south of this point, and 10 metres above, the western watershed reaches its greatest height. This spot is of interest, as the tributaries of the two "first-class" and one "second-class" African rivers rise here. On the north-west is the Kamuchito, flowing into the Luandu and Quanza Rivers, while to the north-east the Munyango rises and joins the Casai River into the Congo, forming the extreme south-westerly point of that river. To the south-east, the Simoe rises and flows to the Lungwe Bungwe and Zambesi, forming the most north-westerly point of the latter.

In Portuguese, such a rise is described as a "mama", or breast—in this case a particularly apt description.

In several places the ridge of the Zambesi-Congo watershed is so narrow that the heads of streams rising on either side, running on the one hand into the Atlantic and on the other into the Indian Ocean, are only a matter of yards apart.

We followed this broken, heavily wooded, sandy ridge until we reached the open country of the Chifumaji Flats near Kil. 1,160 (719 miles). This was the eastern side of the "Hungry Country", which had taken us fifteen days to cross, and here we were able to get fresh supplies of native food, and also to reduce the number of carriers we had found necessary to transport our extra food over this lean and desolate region.

The Chifumaji Flats are an open, treeless, sandy waste, cursed by everyone who has had anything to do with them. For three months they are under water, while for the rest of the year one can die of thirst on them. It is a country to be avoided in any season. It is easy to understand Livingstone's description of his delight on leaving these wastes during his

journey from the south, to enter the short, steep, wooded valleys which drop down to the Casai, there a large river, to the north. The theory once expressed by the eminent geologist, Gregory, that the Congo is pressing the Zambesi watershed to the south is well supported by the evidence in this region. With the short valleys to the north and the long flats to the south, it takes sixty miles to reach the same level on the waters of the Casai, which is only four miles to the north of this extremely flat watershed.

At Luacano Tucker, who had been suffering from malaria, was forced to return, while I continued the trek to the south-east, leaving the main watershed and following the same path that Livingstone had travelled from Cazombo on the Zambesi on his way to Loanda in 1856. I had intended going to the Cazombo rapids—the highest navigable point on the Zambesi, where there is now a mission station—to investigate the possibilities of a crossing there, in case a line was required to join up with the Rhodesian railway system in the future. I also hoped to pick up a fresh lot of porters there to take me on to the Belgian Congo railway, which was then being extended north from Elisabethville. This proved unnecessary, however. I had reduced the number of my carriers to twenty, after the discharge of the surplus employed for transport of food through the "Hungry Country". Some of the remainder had been with me on many safaris in the previous years, and all asked if they could continue the journey with me. I warned them that this would mean another six weeks of hard walking, as I had to get through as soon as possible, and that they would have longer to go on their return journey without me, but they still wished to carry on. (The return eventually took them four months.)

This saved me much trouble in breaking in new porters. The general routine of the safari, with which by then they were completely familiar, began at 5 a.m. with a whistle, while it was still dark. The light tent was taken down, and all loads made up while I had a slender breakfast. At 6 a.m. as it was getting light, all porters had to be under load and moving along the route. There was no stop at all until

11 o'clock, and then only for an hour. The final stop was made at the first water reached after two o'clock in the afternoon. This meant a journey of eighteen miles on some days, on others more than twenty. The longest day we made was twenty-eight miles.

We travelled like this for six days at a stretch, then stopped for one day for trading supplies, running repairs, etc. As I was mapping all the time, I was at the tail of the procession, which went forward in a compact body to the accompaniment of constant chattering and laughter.

The original load for each porter was sixty-five pounds, but with their own junk and the stuff collected on the way, it was nearer eighty pounds as the safari progressed. A carrier's pace under load, which I have often timed in East, West and Central Africa, is just under three miles an hour in the ordinary way, and is the same when they are carrying for themselves. They tire more easily if for any reason the pace has to be increased. We averaged just over twenty miles a walking day for 1,500 miles. This included side trips from the main route.

I had with me a small edition of Livingstone's *Travels*, and it was extremely interesting to do, in reverse, the identical journey that he had made to the West in 1856. His description of the first sight of Lake Dilolo still held good. That first view from the higher ground near-by of the open sheet of blue water, laced with white-crested waves, so unexpected in contrast with the monotonous dreariness of the Chifumaji Flats, is an experience of travel in Africa never to be forgotten.

Near the lake, the story of its origin as told by Livingstone still persists. This origin is supposed to be quite recent, as the region was thought formerly to be the same type of waterless country in the dry season as the surrounding terrain. It is said that a strange old woman came to one of the villages on the land now covered by the lake, and asked for food and shelter. This was refused her. She then made the same request at the next village, where she was warmly welcomed. When she had eaten and rested, she left, but returned a few hours later to

warn the friendly villagers to take themselves and their property to higher ground. The other villagers, seeing their neighbours on the move, decided to follow suit next morning, but they were too late. In the night, waters rose from the ground and formed the Lake Dilolo, beneath whose surface the victims of the flood are still supposed to lie.

Some of the villages mentioned by Livingstone on the route no longer exist, but the sites of the larger ones can still be recognised by rings of large trees of the ficus variety, grown no doubt from the posts which once formed the protective stockades.

From Cazombo I turned north through the Va-Luena country to the Zambesi-Congo watershed again, striking it at a point to the west of where three countries meet—Northern Rhodesia, the Belgian Congo, and Angola. Nhakatola, the queen of the thickly populated country of the Va-Luena, lived half-way along the distance, near Nanakandundu, but at the time when I passed her residence, she was away. Nearly all the tribes encountered on the route were ruled by women chieftains with the title or prefix of “Nha”. The late Queen, mother of Nhakatola, was a well-known character, a powerful and ambitious woman, contemporary with Lobengula and other great African chiefs of the last generation to hold power. Her raiding parties penetrated far into the surrounding territories. As the district is extremely rich in native food products, it was a fitting-out centre for trading and slave caravans following the main west-to-east route, which passed through her country on their way to the interior. She exacted tribute on all food supplies from the caravans. Rice and cassava (manioc) are the principal foodstuffs of the country, but the main industry of this large swampy area, when the waters subside, is fishing. The fish obtained are mostly mud barbel, which are dried and bundled and then traded as far afield as Katanga, several hundred miles away.

The Nhakatola of 1920, her daughter, was described to me as a good-looking woman, with refined features and small hands and feet, not unlike the ancient Egyptians in type, and quite different in appearance from her subjects. She had not

the same power over them, however, as her mother had had. She usually travelled with her daughter, who was a girl of eighteen at that time, and also, from all accounts, attractive looking. On my way through, I stopped at her headquarters, where her dwelling-place, a well-built three-roomed brick house with a veranda, stood well apart from the huts occupied by her staff. There I left my tribute, in the shape of a roll of white trade calico, spotted blue.

I was somewhat relieved to learn that she was away superintending the fish harvest, which was her largest source of revenue. I had been warned that she was apt to attach herself and suite to any party travelling through her realm, and if she fancied, she was accustomed to exercise a royal prerogative, and share both board and bed during her visit. I did not stop to inquire into the truth of this, but not being a budding Alan Quatermaine, I hastily dropped my tribute and sped northwards. I was in camp, a comparatively safe twenty miles away, when her runners overtook me with a message to the effect that she had heard I was passing through her territory, and was sorry she had not been at home to receive me. If I would wait, she would like to greet me, and make me a present in return for mine.

It appeared that the least I should be expected to accept would be a gift of dried barbel. The whole safari was reeking with it already, and anyone who knows this delicacy will agree with me that reek is the only word. The possible alternative alarmed me still more. I was not looking for romance with dusky queens, no matter how attractive, and I was in a hurry to get through; I had little difficulty, therefore, in resisting the temptation of her offer, and like Joseph of a bygone age I got well away while there was still time.

Until recent years, with the advent of the railway, the natives of this part of the world were not in the habit of wearing cloth, and consequently were very scantily clad. The fabric used was principally bark cloth, which was worn by both sexes, while a very few square yards of such a luxury as calico, when obtainable, sufficed to clothe the women, who quite obviously possessed no set ideas on how or where to

wear it. The women in general were better set up than the men.

Beyond the thickly populated country near the lake, the main tribe of the eastern Va-Luena begin to occupy the rich territories bordering on the Zambesi, their country extending to the watershed in the north. To the east of this is a small part of the Lunda country, and then comes the territory of the big tribe of Western Katanga, the Balubas. The people in these regions build much finer villages and huts than those of the natives in Angola to the west. Their buildings are square, with beautifully thatched roofs, and verandas. An interesting feature is the number of small yellow singing-birds, not unlike canaries, which are kept in each village. They belong to individual owners, and are housed in pretty little cages made of reeds. The sound of their singing in the mornings, as one passed through a village, was very pleasing. The natives always carried these pets about with them when travelling.

On such a safari, I passed through a number of different tribes, each with its own varying customs and occupations, and its own language. At times it was necessary to speak through more than one interpreter. Money was unknown, and useless for barter. The principal items in demand, for exchange, were calico, when obtainable, and salt. Salt was especially popular, as there was none in the country. It was a primitive part of the world, and when there were no live coals to be had, fire was still being made by sticks and friction. The natives would cut a square shallow hole, about half an inch long, in a piece of flat hardwood, with a small outlet on one side, where tinder was placed—usually a piece of dry bark cloth. Sand was then sprinkled in the square recess, and a rounded stick of softer wood inserted and twirled rapidly between the palms of the operator. Sometimes when the materials were refractory, the performance was carried out in shifts. As soon as the tinder showed signs of smouldering, it was hastily transferred to the bowl of a pipe, and drawn until a flame appeared.

During the cutting up of a hippo one day—not a pleasant

sight at any time, as the immediate eating of the flesh is often independent of any cooking process—it happened that all attempts to make a fire had failed in the dampness of the surrounding swampy ground. As there were no matches available, I stripped a rifle cartridge and placed some of the strips of cordite in the lip of the firestick notch, instead of the tinder. The fire-makers were rather scornful of this, until it suddenly flared up, when they all promptly bolted. After another trial, they approved the idea and summoned up sufficient courage to stand by for the next flare. I gave the headman the remainder of the strips afterwards, with a special caution not at any time to use this material in his gun, or it would blow it to pieces. He replied that such a treasure, which could make fire so quickly, would only be kept for occasions of real necessity.

As my principal task on that safari was to map the country as I went along, it was necessary to find guides to give information, and provide the names of the natural features passed en route. It was seldom that the natives knew more of the country than the radius of a day's journey from their own village, so fresh guides had frequently to be employed, and it was not always easy to get them. Although on occasions they might volunteer for reasons of their own, as a rule their confidence had to be gained before they would consent to accompany the expedition.

Through the ages, until quite recent times, these territories had been raided for slaves and provisions, consequently all visitors were suspect until they had proved their *bona fides*. Although the carriers, on the approach to a village, always shouted from a long way off the details of one's native name, identity and business, this precaution did not always work. I would enter a village at times to find not a soul in sight, although fires were going, cooking pots were bubbling, and on all sides were signs of recent occupation. The only inhabitants left would be those too old or too sick to move, by now almost witless with terror. In the case of the sick, it was a great advantage to be able to play the role of healer, and on these occasions a medicine chest was an invaluable asset. After

one or two amateur efforts at doctoring, confidence would be quickly restored, although this was at times a great drain on the resources of the chest.

I met with an interesting case one day—an African treatment of blood-letting by the old-fashioned method of cupping. As usual, on our entry into the village, the inhabitants had cleared out, leaving an unfortunate man lying on his face, thoroughly frightened, but unable to move. Alongside him was a half-gourd of clotted blood which had already been drawn, while on his back there were still three cups, and several round pink spots, about three inches in diameter, from which cups had been removed. These cups consisted of sections of small gourds, their tapered ends uppermost. Though we managed to assure the man that we were friendly, I could not find out either the nature of his malady nor the method of applying the cups, although it appeared to be quite an effective treatment.

In another village we met yet another unfortunate who had been unable to join the rest in their usual retreat into the bush. He was the sole occupant of quite a large kraal, and was suffering from snake bite. One foot was very swollen, and showed the marks where the fangs had struck. He was obviously in great pain, and the local remedy did not seem to be doing much good. It was a small tortoise shell, four inches long, which was filled with dung, weeds, and other filth, and tied round the ankle above the wound with a string of bush fibre. That one I dealt with by removing the shell and filth, much against the patient's will, then making incisions near the wound, rubbing in permanganate of potash, and following up the external treatment with a beaker of Epsom salts.

As I was camped in the neighbourhood for a couple of days to finish up some plan work and trade supplies for the trek ahead, I had the satisfaction of watching my patient return rapidly to normal. With the return of the population, my fame as a healer went forth far and wide. This stood me in good stead. From then on, I had no difficulty in getting all that I wanted in the way of food and guides, although at the cost of a very depleted medicine chest, as subsequently every man,

woman and child in that kraal seemed to experience every sort of known or unknown ill—principally the latter.

In one of these suddenly evacuated villages, a young man, rather braver than the rest, came back to inspect us. I persuaded him to accompany me to the next camp, and though he agreed to do so, he never got there. We were just clear of the village, passing a solitary hut beyond, when a very old hag—possibly a witch-doctor, as she was hung around with all sorts of odds and ends of fetishes—came out and cursed us all, particularly the young guide. He was walking a couple of yards ahead, and I could see him visibly wilt with fear. While still in earshot of the old hag, who was then working on the carriers behind, an outsize in snakes shot across the path immediately in front of the guide, and that decided him. He shot off in the opposite direction with the velocity of light, leaving us to continue the trek alone.

My own boys, who witnessed the incident, were emphatic that the old witch had deliberately loosed the snake off on us, and the young villager evidently thought so too. It was one of the only two snakes I saw on that long walk, most of which led through the bush or along native paths. Snakes here were either fewer in number than further south, or else much better at getting out of the way.

In remoter parts, where white men are few, each one is known among the natives by a name of their own devising, a name denoting some individual peculiarity, which is difficult to discover and to translate. Some of the names I have been known by in various countries have been curious, yet on the whole apt.

For instance, in the Beira country in Portuguese East Africa, I was given the name of Balata, which in the local tongue meant either a bridge or a cockroach. As I was connected with the former, I prefer to think it meant the bridge. Another was M'pondera, the man who did not sit still—in other words, a fidget, and therefore not inappropriate. In Northern Rhodesia, it was M'pala-pala, which meant the sable antelope. Although I had black hair, I could not see that I bore any resemblance to that handsome beast. It was never-

theless prophetic, as in later years in Angola, after I had brought the Giant Sable Antelope of that country to light, the species was named after me.

In Angola, my "kaffir name" was Kwangoni. I never found out the exact translation of this, although there were several suggestions. One was "the eldest son", which did not seem to have much point. Another version was an expression used among the natives when debating whether they would sign on with an agent collecting labour. It was taken to mean "He is all right, we will go with him". Another translation, still more flattering, was "He will not let you down". Whichever it was, the effect was helpful, and it was generally shouted, like a reference, by the carriers when we approached strangers or a strange village. It was surprising how far the knowledge of such names could travel—possibly by bush telegraph. Once I was delayed at the crossing of a river, as I had sent my canvas boat back at the frontier to save loads in my Belgian Congo trek. The local natives had crossed the river and tied their canoes up on the far bank, which they invariably did either for protection or to exact tribute for ferrying. After some delay, the headman came across, and apologised. He said he did not know it was "Kwangoni", and offered to take us over at once without the customary parley. He was better paid than usual, for the compliment implied.

One of the wise maxims of the old prospector in Fitzpatrick's *Jock of the Bushveld* is "Independence is the Soul of Africa"—and how sound it is. I have always found it invaluable to have a working knowledge of the essentials required in bush life, such as the inspanning and outspanning of animals, whether oxen or mules, the management of different types of boat and canoe, and anything else that might present a problem.

On the Zambesi and Kafue Rivers I had learnt to paddle the native dug-out canoes in the way the natives did themselves, either with the short paddle, or standing up in the stern with a long one. This came in useful once, when it seemed that I was going to be held up on one of the larger rivers, where the natives were rather truculent. As usual they

had tied their canoes up on the other bank, coming over in one canoe to parley. Terms were discussed, the payment to be so many stretches of calico—that is, the measurement from chin to arm's length, roughly one yard. The argument had been in progress for some time between my head boy and the canoe owners; meanwhile, I wandered about without taking any apparent interest in the deal, and finally worked my way down to their dug-out. I examined the paddles, and though they watched me doing so, they paid no attention, as usually only a river-native can handle a canoe, and it did not enter their heads that a white man might have some knowledge of their craft.

When the moment seemed propitious, I climbed in and pushed off, heading the dug-out upstream by the orthodox method, and crossing to the other side. The look of consternation on their faces was well worth the effort. They were now stranded on the wrong side of the river, without transport back. The parleying came to an end in a great shout of laughter from my own boys, in which the canoe owners finally joined, as most Africans will when they see the joke is against them. I then towed one of their other canoes back with me, when they entered thoroughly into the spirit of the thing. With much chaff and laughter on both sides, they ferried my party and the loads across without any further argument as to the cost. I eventually paid a fair price, and we parted on the other side the best of friends.

Among the minor nuisances on that type of safari was the problem of the "camp follower". A number of natives were then making their way to work in the Katanga mines, accompanied by their women and children, and made constant attempts to join in the safari amongst my carriers, either for protection or for food. This slowed up our pace, and therefore had to be discouraged. One of these fellow-travellers I discovered had joined the party for his own private ends—the collection of debts owing to him, as an injured husband, on the loss of his wife. The erring lady lived with the third member of the triangle some two days' journey further on. The husband was afraid to go and demand his rights by

himself, considering that he would have a better chance if he arrived in company—particularly ours. I let him come along, as I was interested to see how, in this case, native justice would be carried out.

The award made by the native tribunal for the loss of this wife was one slave, one dog, one gun, two chickens, and two stretches of calico, which seemed a somewhat mixed bag. So far he had collected the slave, the dog and the gun, but then the other side had evidently dug their toes in and refused to be penalised further, so the balance was still owing. (A slave in Africa, although treated as one of the family, still remains a slave, and is liable to be disposed of at the owner's will. Domestic slavery such as this is recognised amongst most African tribes, and the slaves themselves are reconciled to their status, and to the fact that their children will be born slaves as well. However much this may be concealed from the outside world, and the facts glossed over, it will take generations to eradicate the custom, even among those natives who have acquired a certain veneer of civilisation, and are apparently sophisticated.)

When we arrived at the village where this African Helen of Troy was living, I asked to see her, so she was duly produced and the story confirmed. Judged by our standards, the source of the trouble, from her appearance, would have been dear at the price of the outstanding items. However, the deserted husband held other views, and though as far as I could gather he had little hope of collecting the balance of the payment, the controversy was still strenuously under way when I left, unable to await the outcome.

After leaving the main Zambesi-Congo watershed as it swings to the south, the route I followed, as the most direct, was practically the same as that now covered by the Belgian Congo Railway where it runs to join the Benguela line.

The journey ended one afternoon at a wood-and-iron telegraph hut, then the station at Tshilongo on the newly-laid line from Elisabethville to Bukama. As I entered the room, the Belgian operator was at work at his instrument. It was some time before he looked round, to ask me what I wanted.

I asked if I might send a wire, to which he replied that it was not possible. I then asked if he would send a service message to the Director to say that Varian had arrived from Angola. His attitude changed immediately to friendliness. He told me that by a curious coincidence, when I came in he was actually dealing with a message being sent through the line to inquire if anyone had any news of me, as I was overdue and had not been heard of for several months.

A service coach was sent down from Bukama, attached to the first construction train to Elisabethville, where I arrived the next morning; and so ended a three months' walk from West to Central Africa, through some of the least known and most remote parts of the continent.

The information that I had gained was needed as soon as possible in London. I therefore went on by train to Cape Town, stopping off at Salisbury, where I had been asked to visit the Mazoe Dam, which had recently been completed. Some leaks had developed on its face, and as I was going home direct to the Consulting Engineers, I would be able to give them a verbatim report on the matter.

From Cape Town, I sailed in the *Saxon* for England. The Union Castle Company very kindly rigged me up a large cabin as a drawing office, so that I could complete my plans and reports before arrival in London. Lord Buxton, the retiring Governor-General of the Union of South Africa, was on the ship on his return home. He showed great interest in my recent journeys, and Robert Williams' schemes and projects for the further opening up of Africa.

Now that all the necessary information was in hand, finance was duly arranged, and the final contracts for the line to the Belgian Congo frontier were made. There were still post-war difficulties to be met in obtaining permanent-way materials and steelwork, and so progress was slow. There were no engineering difficulties, however, and the earthworks were light along the fertile red-soil country of the plateau which ends at the Quanza River, where the railway crosses at Kil. 726 (Mile 450) on a rail-and-road bridge of four spans of 40 metres (131 feet) each. The progress of the plate-laying

was held up here for some time during the construction of a temporary bridge.

Thirty kilometres or nineteen miles beyond the Quanza River, at the crossing of the swampy Kwiva River, is the last bridge of any importance, a road-and-rail bridge of two spans of forty metres, similar to those on the Quanza River crossing. The picturesque Kohemba Falls, already mentioned, are on a tributary of the Kwiva. From here to the frontier the complete absence of stone along the route of the line, either for building or ballasting purposes, was a great handicap both to construction and maintenance.

Along the valleys of the Kwiva River tributaries, before the final ascent to the Zambesi-Congo watershed, a number of peaty bogs were encountered. Owing to their depth, these presented a serious drainage problem. An experiment was made in processing the peat for engine fuel, which, had it been successful, would have solved the difficulties which are ever-present in countries where there is no indigenous coal, and only wood is available. After a few years, supplies inevitably become scarce within practical distance of the line, and the only solution is the plantation of fuel timber. This has been carried out along suitable sections of the Benguela Railway. An expert was brought out for the peat project, and a small experimental plant erected. Although this local peat produced results, and it was possible to fire an engine with it, it was not a practical proposition, chiefly for economic reasons, and had to be discontinued.

The Zambesi-Congo watershed begins at Kil. 860 (Mile 534), and the highest point of the line, at an altitude of 1,495 metres or 4,959 feet, lies between the Quanza River and the frontier, some 470 kilometres, or 291 miles away.

It was fortunate that the main direction of the line coincided with this great watershed, as it made for ease of construction. There were only two bridges, where the alignment left it, in 300 miles. In places it was so narrow that it was necessary for the line to continue on it in embankment.

After the crossing of the Quanza River, there were no

further delays of any consequence, and the construction advanced at a normal rate towards the original frontier, at Beacon No. 34 on the Belgo-Portuguese frontier, at Kil. 1,241 (Mile 769), which was situated just south of the most southerly bend of the Casai River, before it makes its final turn to the north.

Before the line reached the frontier, the Portuguese Government ceded to the Belgian Government for their railway a small tract near the mouth of the Congo River, in return for a much larger one in Eastern Angola. This entailed the re-adjustment of the frontier to the Luao River at Kil. 1,346 (Mile 835), with the consequent extension of the Benguela Railway for another 106 kilometres or 66 miles. This final point was reached on 25th August, 1928. It was not until the 10th June, 1929, that the opening ceremony was performed by Senhor Bacelar Bebiano, Portuguese Minister of the Colonies at the time.

The opening was a picturesque ceremony, and was attended by a distinguished gathering from various parts of Europe and Africa. The guests arrived in the *Cærnarvon Castle* from England, and the S.S. *Angola* from Lisbon. Those from Central and South Africa arrived via Elisabethville by means of a motor service specially organised by the Benguela Railway for their transport. This motor service continued to run a fortnightly schedule between railheads in Angola and Elisabethville until the two railway systems were connected.

H.R.H. Prince Arthur of Connaught travelled out with Sir Robert Williams, Bt. On the special train, before they reached the frontier, His Royal Highness presented Senhor Bebiano with the insignia of the Grand Cross of the British Empire, and the High Commissioner of Angola, Commander de Camara, with the Knight Commandership of the same order, on behalf of His Majesty, King George the Fifth.

At the frontier beside the line, on the Angolan side of the Luao River, is a huge granite boulder, transported from the coastal region. On this boulder is a brass plate on which is recorded the following simple inscription:

CAMINHO DE FERRO DE BENGUELA.

CONCESSAO A ROBERT WILLIAMS—28 DE NOVEMBRO DE 1902.

CONSTITUCIAO DA COMPANHIA—26 DE MAIO DE 1903.

CONSTRUACAO CONCLUIDA—28 DE AGUSTO DE 1928.

INAUGURACAO SOLENE—10 DE JUNHO DE 1929.

The translation in English is:

THE BENGUELA RAILWAY COMPANY.

CONCESSION GRANTED TO ROBERT WILLIAMS—28 NOV., 1902.

FORMATION OF COMPANY—26 MAY, 1903.

COMPLETION OF CONSTRUCTION—28 AUGUST, 1928.

FORMAL OPENING CEREMONY—10 JUNE, 1929.

In the background lies the Central African bush and forest, with the rushing waters of the frontier river Luao passing near-by on their way to join the mighty Congo.

Here then, is the terminal point in the history of this great project, begun just after the conclusion of the Anglo-Boer War, when Sir Robert Williams obtained the concession to build the line, and ending with the laying of the final rails to the frontier nearly thirty years later. That granite boulder might well have borne an epitaph, instead of its legend of success, had it not been for the indomitable courage of Williams, and the loyal help of his Portuguese friends. Foremost of these was General Sir Joachim José Machado, K.C.M.G., Governor-General of Moçambique, who became the Company's first managing director, guiding and directing its interests from 1902, the date of the concession, until his death in 1925, when he was succeeded by his son, Commander Alvaro Machado.

Here ended an integral part of Williams's splendid scheme of development, begun in the 1890's, when he first initiated the exploration and exploitation of the vast riches of the Katanga, away in the heart of Africa, fifteen hundred miles from the Coast. At the same time, here ended my active work of thirty years on the construction of pioneer railways, during which time I was privileged to play a part in transforming the dream of African development into a reality.

Looking back on those thirty years of effort, with all the troubles and financial anxieties that hampered progress and confused our aims, one cannot help but contrast the achievement of private enterprise, as directed by the great Empire Builders of yesterday, with the so-called planning of to-day's bureaucracy, in the name of the development of Africa. If only men of the stature of Rhodes and Williams could have availed themselves of a tithe of the vast sums squandered so prodigally by inept doctrinaires in recent years, the advancement of Africa would have forged ahead, and schemes such as the Cape-to-Cairo railway would have been accomplished fact, with incalculable benefit to humanity. The completion of this railway alone would have saved thousands of lives and millions of pounds worth of material during the two World Wars.

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During the construction of the Benguela Railway, other empire builders were busily engaged on the far side of the frontier in the great territories of the Belgian Congo, in the development of their colony, revealing new mineral wealth at every turn. Under the guidance of men such as Jean Jadot, and others, railways and waterways were constructed and cleared.

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CHAPTER X

THE BELGIAN CONGO

ALTHOUGH there is a possibility that the railway of Cecil Rhodes's dream, the Cape-to-Cairo, may eventually reach the Nile through the various countries on the eastern side of the Great Lakes, this dream, for want, at the time, of further objectives on the originally proposed route, really ended at Broken Hill in 1906, some 2,000 miles from Cape Town.

The diversion beyond Broken Hill to the west towards the Belgian Congo was fully justified by the many objectives on that side, so this trunk railway was continued until it reached the navigable waters of the Casai and Congo Rivers. Here for all practical purposes is the end of this western route. To the north there are no immediate objectives in the hundreds of miles of the Equatorial Forest while the way is barred by the waters of the mighty Congo River, which also serves as the western outlet to sea-going traffic from Matadi to its mouth.

The Independent State of the Congo, with the possible exception of South Africa, is one of the richest States in Africa; in it there is every form of mineral and vegetable wealth. It was originally founded in 1885, and became a Belgian Colony in November 1908.

It was not until the 'nineties of last century that the development of this important State was undertaken seriously. The first commerce—tropical produce such as rubber, palm oil, wax—was developed along the magnificent waterway of the Congo, which gave every access to the interior. The rich mineral provinces of the south, in Katanga, were inaccessible from the northern routes, so the various expeditions visiting them usually approached through the Zambesi and ports on the east coast.

Then during the late 'nineties, when King Leopold granted Robert Williams the concession for prospecting and develop-

ing the minerals of Katanga, approaches were made from the railhead advancing from the south. However, some of the original discoveries were made by expeditions that he (Williams) sent in to Katanga via the Zambesi.

About that time, the only few mineral deposits that were being prospected, existed in what is now known as Northern Rhodesia, and they were the Kansanshi Copper-mine just south of the Zambesi-Congo watershed, belonging to the Tanganyika Concessions group, and Broken Hill and B'wana M'kuba which lay to the east of Kansanshi, and belonged to the Northern Copper group. While these mines in Northern Rhodesia which were on visible outcrops, were being worked, the existence of the Great Copper Belt in that country was unknown, due to its being well hidden below ground.

It was evident that the copper belt in Katanga, which extends for some 200 miles north of the Border, was of an outcrop nature, and easily located. In fact Sir Robert Williams used to say ". . . all one needed to prospect copper in that district was a good pair of field glasses on higher ground, and then look for any hill or kopje, that was bare of bush or scrub, and there one was sure to find copper. . . ."

The penetration of the country along the Congo River would be easy, were that waterway not bedevilled by a series of rapids. While navigation is possible for the lighter products of tropical commerce, they make impossible the kind of transport necessary to carry the bulk traffic required for mining development.

There are a number of changes from rail to steamer and vice versa, which not only cause delays but make a considerable increase in the cost of transport. The river is navigable for ocean-going vessels from its mouth to Matadi, a distance of ninety-five miles; between Matadi and Leopoldville on Stanley Pool, the rapids are by-passed by a railway, on which there is some heavy engineering work, for 227 miles (365 kilometres). Between Leopoldville and Stanleyville is the longest stretch of navigable river, which, with its entering tributaries, form waterways that extend for 7,000 miles. Beyond Stanleyville, the falls are avoided by a short section

of railway to Ponthiersville, a distance of 78 miles (124 kilometres). Higher up the river another section of railway from Kindu avoids the rapids on this section, joining the River again at Kabalo, before turning east to Albertville, the western port on Lake Tanganyika; this section in all is 444 miles (715 kilometres). This line forms the connection between the west coast and the east coast via Lake Tanganyika, Kigoma on the east of that lake, to the port of Dar-es-Salaam in Tanganyika Territory on the east coast. At Tabora on the Central Railway it connects to the north with Kenya via Mwanza and Kisumu on Lake Victoria Nyanza, and so on to the Nile.

From Kabalo on the Congo River there is a clear navigable stretch by steamer to Bukama, which is the highest point for river traffic on the Congo River.

The railway from the south crosses the Congo at Bukama and continues on to Port Francqui, a further distance of 702 miles (1,132 kilometres). It was started from Bukama in 1923, and completed in 1928. The country through which it runs is partly in the Equatorial Forest, and generally not so productive as the districts in the south, but it forms the main direct outlet, as alternative to the long rail and river route already mentioned, for the Belgian Congo to the western sea.

Port Francqui is on the highest navigable point on the Casai River, and therefore connects Matadi through Leopoldville. It forms the terminus of the through system of railways, which is continuous from Cape Town, 3,400 miles (5,480 kilometres), a distance greater than that between New York and San Francisco.

This final section to the north was formally opened by Their Majesties King Albert and Queen Elisabeth of the Belgians, in August 1928.

At that same time, the last lengths of railway track were being laid in Angola on the re-adjusted approach to the frontier in that country, which eventually formed another outlet for the Belgian Congo to the west.

It has been shown that it was not practically possible to carry the heavy traffic of mineral production along the original

communications of the country. This stage of development had to await the arrival of the railways from the south. Active progress in the development of a number of mines had been carried on since the original granting of the concession, and ox-wagons had been in use, where practicable in districts clear of tsetse fly, for the transport of the more essential parts of light machinery. Even traction-engines had been tried but found unsuitable, so there was delay in production until the advent of heavy plant by rail.

The origin, construction, and difficulties of financing the network of lines in the Belgian Congo required for the bulk traffic to and from the various mining centres, are well described in the following extract of an address given at the Scientific Congress at Elisabethville in 1950 by M. P. Sorel, Administrateur-Délégué de la Compagnie du Chemin de fer du Bas-Congo au Katanga.

“. . . It is not possible to write an historical account of the Katanga Railway without previously examining its history at the beginning of the century, the progress of prospecting for minerals in Katanga, and the development of communications in the neighbouring countries, for the establishment of a railway line in Katanga, which would have permitted the working of the mineral wealth discovered, and its transport to a sea-port.

Only a few months after its formation the 'Special Committee of Katanga' concluded an agreement with Sir Robert Williams in November 1900 in which Sir Robert was to undertake the investigation of mineral wealth in the Upper Katanga.

The 'Bia-Francqui' expedition with the assistance of Jules Cornet was able to trace the geology of the Katanga district and establish the first precise information on the presence of copper ore, of which, previous explorers had pointed out the existence.

The agreement made between the Katanga Special Committee and Sir Robert Williams would allow the full exploitation of Katanga's mineral wealth.

As to the means of communication between Katanga and the neighbouring countries, the railway from the Cape,

after reaching Bulawayo in October 1897, was continued as far as the Victoria Falls, with the possibility of its extension later towards Broken Hill.

The discovery of the copper mines of Kansanshi on the Rhodesian side of the Zambesi-Congo watershed permitted the hope that the Rhodesian Railways would extend as far as this.

But this extension was only a hope, and Sir Robert Williams was considering the construction of a railway line—for which moreover he would obtain a grant, on 29th October, 1902—which would run across Angola and would connect the Port of Lobito with the Kansanshi mines and Katanga.

It was on these terms that the Congo Independent State concluded, on the 12th June, 1901, an agreement with Sir Robert deciding the basis for the formation of a Committee of Investigation and of a scheme to construct a railway line connecting a point on the southern frontier of the Congo Independent State to another point situated on the Lualaba River, to the south of the confluence of this river with the Lufira River.

This Company was to be established within the next twelve months.

Nine months later, on the 11th March, 1902, the decree was published declaring the establishment of the Katanga Railway Company. By the regulations, this company had as special object the completion of a railway line connecting the stipulated points in the agreement made with Sir Robert Williams. This Company could also construct and exploit this railway line.

The registered capital was fixed at a million francs of which 60% was subscribed by the Congo Independent State and 40% by Sir Robert Williams's Company; the Congo Independent State had reserved the right to subscribe 60% of all increase of capital in the Company.

The Company was to be managed by a Board of Directors consisting of six members of which three were to be nominated by the Congo Independent State and three by the General Assembly.

The first Administrators were Messrs. Heyvaert, Cousin and Dutillieux appointed by the Congo Independent State,

and Messrs. Williams, White, and Leyland, nominated by Sir Robert and his Company.

It was immediately noticed that the outline of the regulations of the Company was at the same time both logical and indefinite.

It was logical because in contemplating its southern terminal point on the southern border of the Katanga, it was considering its connection with the Rhodesian Railway system, and, on the other hand, in fixing the northern terminus to a point situated on the Lualaba River it allowed its connection with a waterway, the Lualaba River.

It was indefinite because neither the northern nor the southern terminus was established.

It could be expected, at the time, that the southern terminus would be at Musofi, on the opposite side of the frontier to Kansanshi, since it was hoped that there would be an extension of the Rhodesian Railway line as far as Kansanshi, but the choice of the northern terminus was left to the discretion of the Company.

Five months after its constitution the Company was to carry out the programme that had been decided. On the 22nd August, 1902, as a matter of fact, it concluded an agreement with the Special Committee of Katanga, requesting the latter to carry out the survey of the railway according to the programme in common accord.

The Katanga Special Committee immediately engaged the necessary staff and the first survey mission embarked on the 22nd November, 1902, for Africa. The leader of this mission was Commander Jacques who was later on to distinguish himself during the 1914-18 war, and was created Baron Jacques de Dixmude.

All the instructions given were performed by September 1904; the first survey mission came back, and returning, made, on the Congo Independent State's account, a survey between Ruwe and Lusambo, returning to Belgium in April 1905.

Before referring to the second survey mission and the instructions given to it, it is essential to review the means of communication to the south and west of Katanga and the results of mineral prospecting made by Sir Robert Williams and Tanganyika Concessions Ltd.

In Rhodesia, the hope they had had of the extension of the Rhodesia Railways as far as Kansanshi had not materialised, and the railway had not yet reached Broken Hill. On the west side the difficulties encountered in the construction of the first part of the Benguela Railway had necessitated much more capital expenditure than had been anticipated. Therefore the concessionaires of this railway, with a view to shortening the length of the line, contemplated the alteration of its alignment in the direction of Ruwe, instead of Kansanshi.

As for the mineral prospects of Katanga, three mineral zones had been specified, a ferruginous zone along the southern border Katanga-Rhodesia together with the mine Shamalenge, where there were deposits of flux, necessary for the treatment of copper ore; a copper-bearing zone, parallel to the first one, situated further north, with Kambove and Ruwe as the principal mines; not far from the latter mine, the Falls of the Zilo had been discovered as the sources of hydro-electric power; finally a staniferous zone on the right bank of the Lualaba, with Busanga as the principal mine.

It was these various elements which determined the working programme of the second survey mission of the Katanga Railway Company.

It was in fact instructed to make a survey of a possible railway line starting from Musofi, on the opposite side of the border from Kansanshi, along the border of Katanga-Rhodesia following the watershed of the Zambesi-Lualaba, and then leading north having as an objective Ruwe; it was, in addition, to investigate the junction line Ruwe-Busanga, the first portion of the Ruwe-Bukama section, made by the first survey mission.

This second survey mission was under the direction of M. Ckiandi, who was assistant to Commander Jacques, the leader of the first mission.

The mission embarked in May 1906 and completed its work in 1908.

During that time important events happened in Belgium, which made a change in the general direction of the alignment of the Katanga Railway line.

On the 28th and 31st October, 1906, there was formed

the Union Minière of Upper-Katanga and the Railway Company of Lower-Katanga in Katanga.

The Union Minière of Upper-Katanga had for its principal object the development and the working of the mines of the Katanga.

The Railway Company of Lower-Katanga in Katanga had for its object to survey, construct, and to operate, on the Independent State's account, the railway lines connecting Katanga to the Lower Congo, and Katanga to the Portuguese line of Benguela, to realise on the Congo Independent State's account the financial participation of the latter with the Katanga Railway Company, and to proceed to, or to share in the survey, construction, and operation of this line.

To materialise this participation, a mixed committee was formed in April 1907.

The first question put forward was the choice of the alignment.

The projected alignment of Musofi to Ruwe was tempting owing to its length (275 kil.), and its temporary terminus, Ruwe, where it was planned to establish a large central plant to treat ores owing to the huge hydro-electric power available nearby on the Zilo Falls.

To bring in ores from Katanga it was necessary to connect the mines of Kambove, Likasi, and the 'Etoile du Congo', which necessitated the construction of 300 kilometres of line. On the other hand, the junction with the Rhodesia Railways at Kansanshi would require an extra length of line of about 180 kilometres to be constructed in Rhodesian Territory.

As the mine traffic from Kansanshi to Ruwe by Musofi was smaller than had been anticipated, compared to the mines of Katanga, it appeared more profitable to build a line from Ruwe towards Kambove, the 'Etoile du Congo'-Mabaya to the border of Rhodesia. This alignment had the advantage of passing through the copper zone and of shortening the line to be built in Rhodesian territory.

Such was the argument maintained by M. Jean Jadot, Administrator-Delegate of the Railway Company of Lower-Congo in Katanga, and as such it was accepted by the

Katanga Railway Company and the Congo Independent State.

So as to obtain the full value of this new plan, it would be necessary that the Rhodesia Railways, which would have reached Broken Hill in 1906, should be extended as soon as possible as far as Mabaya on the border of Katanga.

To this effect, negotiations began with the Rhodesia Railways and the Chartered Company, in which Sir Robert Williams took an important part.

These negotiations were difficult for two reasons. The first was that the Chartered Company, which had to find the necessary capital for the construction of the railway line connecting Broken Hill to the Katanga Border, wanted the assurance that this railway would be extended to the Congo territory. The second was that the 'Union Minière' and the Railway of Lower-Congo, while it was making certain that the tariffs for freight charges on the Rhodesia Railways would not be very high, were not desirous to commit themselves for an unlimited period.

Finally the agreement was signed on the 11th July, 1908, between the Chartered Company on one side, on the other, the 'Union Minière of Upper-Katanga' and the Railway Company of Lower-Congo in Katanga.

According to this agreement, the Chartered Company pledged itself to do its utmost to form, as soon as possible, a railway company having sufficient capital to construct a railway line from Broken Hill to the Katanga Border and to obtain from the Rhodesia Railways a special tariff for the transport of material towards Katanga, and the ore, and metal from Katanga to Beira.

This agreement was to last for a maximum limit of ten years and it could be cancelled in the event of the completion of the Lobito line, or the line connecting the Lower-Congo to Katanga.

It was hoped, after the conclusion of the agreement, that no more difficulties would arise in the construction of the railway line connecting Broken Hill to the Border.

Unfortunately, it was not so.

Hardly three months after the conclusion of the agreement of July 1908, the Chartered Company announced that it was not possible to raise the necessary capital

for the extension of the Rhodesia Railway beyond Broken Hill.

Everything would have had to be done over again if Sir Robert Williams had not immediately found a way to put the trouble right again. He contemplated the Tanganyika Concessions Ltd., taking over the commitments of the Chartered Company by means of granting new mineral concessions to the new Rhodesia Railway Company.

The negotiations between the Chartered Company and the Tanganyika Concessions quickly led to an agreement which was signed on the 1st November, 1908.

In view of reducing the amount of capital to be raised the Tanganyika Concessions asked for the reduction of the line on Rhodesian territory, by entering the Congo territory near Sakania, which meant lengthening the Katanga Railway a matter of 100 kilometres.

On the other hand, one of the principal sources of funds anticipated by the Tanganyika Concessions, was Messrs. George Pauling, the railway contractors, who put forward as a condition for their participation in the financing of the scheme, the contract for the construction of the section of line in Rhodesia as well as that in the Congo as far as the 'Etoile du Congo'.

Lastly, the Tanganyika Concessions, having simultaneously financed the construction of the Benguela Railway, and the Broken Hill line to the border, met with some difficulties in subscribing its share in the increases of capital in the Katanga Railway, which was necessitated by the construction of the extra length of line.

The 'Union Minière' of Upper Katanga was then asked to act as substitute of the Tanganyika Concessions and take over their share in the financing of that section of the line, including the one between the border and 'Etoile du Congo'.

These factors brought about the agreement concluded on 30th January, 1909, between the Tanganyika Concessions, the 'Union Minière', the Katanga Railway Company and the Railway Company of Lower-Congo in Katanga.

This time all the difficulties were overcome and it was agreed to carry out the construction of the line with all possible speed.

The construction of the Rhodesian line started immediately; meanwhile necessary measures were taken in order that the working of the Sakania-'Etoile du Congo' section could be started as soon as the Rhodesian line arrived at the border.

M. Slosse was appointed President-Engineer, with his assistants M. Baillieux, the present Administrator-Delegate of Otraco, and M. Odon Jadot, present President of the Katanga Railway Company.

On the 1st December, 1909, the rails reached the Rhodesian border without difficulty; the construction was continued on Congo territory, and, on the 1st October, 1910, the first locomotive reached Elisabethville.

While the first traffic organisation was being formed on this new section under the General Manager, M. Scraeyen, future Director-General of the Company, surveys were being carried out to the north towards Kambove, Tshilongo, and directly towards Bukama.

In April 1911, the construction of the section of the Elisabethville-Kambove line was started.

The financing of these works was exclusively assured by the Railway Company of Lower-Congo in Katanga, in their name and at the expense of the Colony, the Tanganyika Concessions having definitely renounced their participation in all further increase of capital.

As soon as the construction of the Elisabethville-Kambove section was completed, they were anxious to continue the construction of the section between Kambove-Tshilongo. When the war broke out in August 1914, the work at both ends of this section Tshilongo-Bukama had already been started.

In spite of all inherent difficulties of the war the works were carried on, and the inauguration of this section was carried out in June 1918."

The remaining section of 514 kilometres, or 319 miles from Tenke, near Tshilongo, to Luao on the Angolan-Belgian frontier where it joins up with the Benguela Railway was finally completed in July 1931, which then linked the western port of Lobito and the western system of railways to that of Central and Southern Africa.

The development of the Belgian Congo, together with the mandated territories of Ruanda-Irundi, to a well-advanced state, comprising 9,030,000 square miles, was accomplished in a comparatively short time, when the length of its communications and number of well-laid-out towns are taken into consideration.

It was only towards the very end of the last century that it commenced to emerge from a state of primitive barbarism. There are still great areas in the remoter parts, such as the Equatorial Forest, which have yet to be penetrated, but the occupied zones show a high state of civilisation after a period of less than fifty years.

All this has been accomplished by a proportionately few Europeans, who, after those years, only number about 57,000, of which roughly 34,000 are Belgian nationals; most of the whole population of whites is centred in the larger towns and the mining areas of Katanga.

The native population, ranging from the primitive pigmy tribes of the Equatorial Forest to the tall aristocratic-looking Watussi of the Ruanda-Irundi, numbers about 14,000,000. They are mostly of Bantu stock, but vary considerably between those of the low-lying countries athwart the Equator, and those of the higher lands to the south.

Through the efforts of the Administration, the scourge of sleeping sickness, so prevalent amongst the natives in the earlier days of occupation, has been greatly abated. All efforts are being made to reduce illiteracy amongst the natives, and to develop a high standard of education with the co-operation of the many missions—mostly Roman Catholic White Fathers, Jesuits, and the like—the Protestant missions being in a minority.

The efforts of all missions are well supported by government grants, as more than half of the total expenditure, which is a liberal one for education, is absorbed by the missions which carry out the various systems required.

These grants include also large annual contributions to the general education of the native, by the various corporations, whether of commerce, mining or otherwise, and their influence

is felt in the type of education required, which has produced a large class of artisans and mechanics, so useful in the development of the country.

As in the great neighbouring Portuguese and French States, there is no formal colour bar, but those with sufficient education and aspirations must prove their worth for any advancement. The official language is that of the governing power.

In these primitive countries, as one has had good reason to know, there is in most cases a different group or tribe to be encountered every few hundred miles, or less, which has nothing in common in language, customs, or pursuits with its near neighbours. Co-ordination by a central power is the only means of the government of the whole.

Although self-government may be possible among the more advanced peoples such as the big Muslim communities, it is doubtful whether there will ever be sufficient cohesion to warrant it amongst the scattered groups of the more primitive Bantus.

The spread of propaganda and of harmful doctrines, with delusion of the African, by self-seekers, appears to succeed firstly among the lesser tribes, as opposed to the old fighter classes. Should these vociferous minorities gain their ends, it could only be under the protection of the co-ordinating power, as otherwise they would be promptly eliminated by the warrior tribes, to whom they were subject in the past.

There is propaganda throughout the whole of Africa for self-government, and possibly the stabilisation of the continent generally will, in the future, depend on the Colonial powers retaining their co-ordinating influence over the variety of peoples within their borders.

In the more closely-settled areas of native population there is evidence of a sound agricultural policy in the well-terraced fields and the absence of wasteful peasant husbandry with its inevitable erosion. This absence is no doubt assisted by there being very little stock or cattle owing to the prevalence of tsetse fly, so there is little chance of overstocking and overgrazing, which is one of the early stages of erosion elsewhere.

The communal villages are well laid out with their dis-

pensaries and other amenities. There are more than 90,000 miles of motor roads of varying grades in the territory, but all are well maintained by the local native authorities, with no apparent direct white supervision.

The whole country has had the advantage of being administered by far-seeing men on one central council, on which are represented the interests of administration, commerce, mining, and other activities which go to form the well-being of the State.

The policies formed do not seem to be affected by changes of the home government, neither are they apparently affected by conflicting ideologies, nor the vagaries of experimenting doctrinaires.

Those who have seen this great country in its various stages, from the primitive to its present state, cannot but remark on the sound policies of colonial development which have made all this possible

CHAPTER XI

EAST AFRICA

DURING my thirty years in East, Central and West Africa, my work had kept me in the countries lying between Beira on the east coast and Lobito on the west coast.

I had always had a strong desire, when opportunity arose, to visit the countries to the north. This desire was strengthened by Alexander Barns, who wrote those delightful books, *The Wonderland of the Eastern Congo*, and *The Great Crater Lakes*. He stayed with me in Angola, and wrote another book as a result of our travels in that territory. His graphic descriptions of the heart of Africa inspired my decision to see it one day for myself. My wish unexpectedly came true when I mentioned it to Sir Robert Williams, after the completion of the Benguela Railway.

Sir Robert's general plan for the extension of the railways to the north, in fulfilment of his promise to Cecil Rhodes, was to create objectives for such extensions in order to justify their construction. At that time, the Tanganyika Concessions and its subsidiary companies, of which he was the head and the driving force, controlled mines in development, and prospecting parties ranging from the Kansanshi copper mine in Northern Rhodesia to the Sudan. He commissioned me to make a series of reconnaissances and reports on the possibilities of railway connections to the various mining centres and prospecting districts—most interesting work for me, as it provided a definite reason for visiting parts of the continent which otherwise I might never have managed to see.

To make the most of the remaining weeks of the dry season, after the festivities marking the opening of the Benguela Railway and the subsequent departure of the distinguished guests, I collected the lightest possible camp kit for my journey to the north, and left the railhead by car for Elisabeth-

ville. Here the Tanganyika Concessions had established their headquarters in Africa, under Captain A. A. Thomson, Sir Robert's nephew. I set out from Elisabethville on my first venture, from the neighbourhood of the Kipushi copper mine in Belgian territory on the Rhodesia-Congo border, to the Kansashi copper mine seventy miles to the west, just south of the Congo border in Northern Rhodesia. This mine belonged to the Concessions.

My next objective was in Uganda, and entailed a journey by rail and river, and on foot. I started from Elisabethville by train, through Belgian territory to Bukama, the highest navigable point of the Congo.

The journey down from Bukama was a very pleasant passage through the heart of Africa. We enjoyed great comfort on the steamer, and passed many picturesque villages and much fascinating animal and bird life on the way. From Albertville the steamer crosses Lake Tanganyika to Kigoma in the British Mandated Territory on the east, near to Ujiji, the famous meeting-place of Livingstone and Stanley. My objective being Uganda, I continued on board the steamer to Uvira, at the extreme north of the lake; from this point, there is a steep rise of 3,000 feet up the narrow gorge of the Rusisi River, which flows into Lake Tanganyika from the south shore of Lake Kivu. Lake Kivu itself lies at an altitude of 5,000 feet, and is the highest lake of any consequence in Africa. On this southern shore was the Government post of Bukavu—now a developed township, and renamed Costermansville—at the terminus of the trunk-road on the western side of the Lake, and connecting it with the northern territories.

In those days the only building at Bukavu was a small wood-and-iron structure which served as a rest house. It was managed by an English couple who had a coffee shamba nearby, at the request of the Belgian Government, and until such time as an hotel could be built. I spent a week there awaiting the arrival of the launch which was the only connection with Kisenyi on the north of the lake.

Lake Kivu is one of the great beauty spots of Africa. It has a pleasant climate, and possesses the distinction of being free

from crocodiles and mosquitoes. The scenery of the neighbouring Mufumbiro Range, with the peaks of its extinct volcanoes, one of them snow-clad, reflected in the blue waters below, would be difficult to surpass anywhere in the continent. There is now a delightful bathing place at Goma, near Kisenyi, where the palms, sandy beach, bathing tents and coloured sunshades combine to form a picture resembling a summer resort on the Riviera rather than the heart of Africa. An attraction at night is the glow of the volcano Nyamuragira. Only a few miles to the north, in the mountains, is one of the most famous homes of the gorilla.

There were no buildings near the spot where I landed. I camped on the shores of the lake, before making my way to Rutshuru, where the Administrator, M. du Buisson, showed me every kindness. The District Commissioner at Kabale, on the Uganda side of the border, was Captain Tracey-Philipps, who had been staying with me in Angola a few months before. I had seen him through that territory, and he had then gone on to Uganda by the same route that I was now following. His description of this part of the world, and his offer of assistance should I care to visit him in Uganda, had increased my desire to make this trip long before there was any suggestion of the mission that eventually led me there. He had sent a fresh lot of carriers for me from Uganda, and these were waiting for me at Rutshuru, this being long before the days of motor-roads in those parts.

From Rutshuru, the route to Uganda lay along the north side of the Mufumbiro Range, the chain of extinct volcanoes of which the most easterly peak, Muhavura, lies wholly in Uganda. Sabinyo, its next neighbour to the west, is at the point where the frontiers of three countries—Uganda, German East Africa, and the Belgian Congo—used to meet. Mikenno, further to the west again, is the home of the gorillas. On the saddle between Mikenno and snow-clad Karisimbi, its neighbour to the west, lies the burial place of the famous American traveller and naturalist, Carl Akeley. Nyamuragira, the most westerly peak, is still active, and its periodic eruptions continue to alter the face of the surrounding country.

The Eastern Belgian Congo and Western Uganda are so well described in the books of Alexander Barns that it would be superfluous for me to attempt further detail of their marvels. In general I shall sum it up as a freak country, with nothing to resemble it anywhere else in Africa.

It is said that the Mufumbiro Range are the fabled Mountains of the Moon of the early Arab travellers, and not the Ruwenzori Range a hundred miles further north, which now bear that reputation. It is easy to understand this belief when viewing the Mufumbiro from Rutshuru, as from this point the whole of this unique and magnificent range is seen in crescent formation. This would seem to be more suggestive to the Arab imagination than the massif of the Ruwenzori, which stretches for seventy miles in a single block from north to south. I am glad to-day that I travelled all this area on foot; to my mind, it is the only really satisfying way in which to appreciate to the full the beauties of mountains and lakes.

My work ahead in Uganda, as required by my mission for Sir Robert, was to make a reconnaissance and report on the possibility and the estimated cost of a railway across Uganda from the railhead, then at Kampala, to the Kilembe coppermine. This mine, which was then in process of development by the Tanganyika Concessions, lay in the heart of the Ruwenzori Mountains, about twelve miles north of the Equator.

The Protectorate of Uganda is situated in the heart of Africa, approximately between 4 degrees north and 1 degree south latitude, and 30 degrees and 35 degrees east longitude. It is bounded by the Belgian Congo on the west, the Sudan on the north, and Kenya and Tanganyika Territory on its eastern and southern frontiers. The area totals some 94,000 square miles of which practically one-seventh is made up of the water of its lakes and rivers.

When Stanley first visited this country in 1875, he termed it the "Pearl of Africa". The description still holds good, not only in respect of its natural features and great beauty, but as a "pearl of great price" in its richness and fertility. The wealth of the country lies mainly in cotton, but Uganda also

produces coffee, cocoa, rubber, sugar, tea, tobacco and oil seeds, while the still undeveloped minerals in the west may have a far-reaching effect on the future development of the country, particularly as cheap electric power becomes available from the great undertaking of the Owen Falls hydro-electric scheme.

The Protectorate was extremely fortunate in its early administrators, being blessed by the guidance of such men as Lord Lugard, Sir Harry Johnston, Sir Frederick Jackson, Sir Robert Coryndon, and Sir William Gowers, who was in office at the time of my visit. Both Sir Robert Coryndon and Sir William Gowers had begun their administrative careers as young men in Southern and Northern Rhodesia, in the early days before this country was settled. Sir William, under whose administration Uganda had attained a high state of prosperity, was a man of inspiring presence, with keen grey eyes and a square, determined chin. He had a quick grasp of detail and a power of absolute decision from which there was no apparent appeal. These combined to form a strong personality ideally suited to the administrator of an African state still in the making.

Although Uganda lies across the Equator, it does not suffer from the extreme tropical heat usually associated with such latitudes. The Albertine Rift and Nile Valley, being at an altitude of only 2,000 feet, are naturally warm. But the average altitude of the country is between 4,000 and 5,000 feet, providing a more temperate climate, while in the highlands of the Rift Escarpment to the west, it can be extremely cold. The mean maximum temperature averages 80 degrees, and the mean minimum 60 degrees.

Uganda varies more than almost any other part of Africa in its scenery, ranging within short distances from dry desert to rank equatorial forest. This is due principally to the volcanic nature of its formation, more especially in the west, where the upheavals of nature have produced rugged peaks, plains of lava, and fairy-like crater-lakes, a setting which is sometimes extremely beautiful, lit with wonderful colouring; at other times weird, gruesome, and depressing.

The first impression of the country is always of its amazing greenness—almost the emerald green of Ireland. There are other similarities in its mountains, valleys, lakes and waterfalls, while in the distance the bogs, choked with papyrus grass, are not unlike the Irish bogs in colouring and character. The Ruwenzori Mountains in the north and the Mufumbiro Range in the south have each a distinct charm of their own, their grandeur being so different in type that there can be no comparison. Everything in that wonderland is on so great a scale that its beauty can only be fully realised in perspective.

A few days after my arrival in Tracey-Philipps's "boma" at Kabale, we were visited by the Governor, on one of the many safaris he made to penetrate into every district of his territory. His was a beneficent and progressive régime. The State had provided, out of revenue, excellent public buildings, hospitals, research laboratories, bridges, and some of the finest all-weather roads then to be found anywhere in Colonial Africa. This meeting was most fortunate for me. When I had explained the object of my visit, Sir William not only gave instructions that I was to be given every facility for carrying out my task, but kindly invited me to make my headquarters at Government House. This assistance made all the difference to the work in hand.

Sir William was anxious for a railway to be constructed across Uganda for the further opening-up of the country; but as had been the case everywhere else, the cost of such an undertaking could not be justified without the existence of a definite objective which would produce a reasonable return for the initial outlay. Some years before, the Uganda Government had brought out a party under an officer of the Royal Engineers to make a reconnaissance survey across the Protectorate to the Congo border. This survey, known as the "Stevenson Trace", after reaching Mityana about thirty-five miles from Kampala, swung to the north, traversed the Muzizi River Valley, descended the Albertine Rift north of Fort Portal, and finally ended up at the Semiliki River, which at that point is the frontier between the two countries.

At that time, the prospecting parties of the Tanganyika

Concessions had found copper at Kilembe; but although the prospects were good, they had not proved their find in sufficient quantities to justify over two hundred miles of new construction. It was, however, a welcome possibility for those in favour of the railway project, especially as the route concerned would pass through more suitable country than that of the "trace" to the north.

I accordingly went on to Kampala to collect fresh supplies which had been sent out to me from England, and began my reconnaissance, which was known as "Varian's Trace", as distinct from that of Stevenson.

Both traces followed a common route as far as Mityana, but diverged there. Stevenson's then bore to the north, while mine bore south, descending the Escarpment to the south of Fort Portal and north of Lake George, opposite the site of the Kilembe mine in the Ruwenzori Mountains on the other side of the valley. After reaching Kilembe, the reconnaissance was continued along the foothills of the Ruwenzori Range, via Katwe on the north shore of Lake Edward, to a point on the Belgian Congo border at Kisindi, a distance of 265 miles from Kampala. On the strength of this reconnaissance and report, finance was allowed for a survey over the southern route. This was made by three survey parties of the Kenya and Uganda Railways under Mr. H. F. Birchall. Unfortunately, on the completion of this work, the great slump of the early 'thirties intervened, and although the scheme had had every prospect of materialising, it had to be shelved. It was not until 1951, with the world-wide need for raw materials, especially copper, that Kilembe again became important, though no longer under the auspices of Tanganyika Concessions, and a railway was started towards the mine.

In my memorandum on the reconnaissance, I mentioned the possibility of a large irrigation scheme, which if adopted and developed, might have served as an extra inducement for traffic. The idea was to utilise the waters of the snow-fed rivers Hima, Raboko, and Mabuku, particularly those of the Mabuku, flowing from the Ruwenzori. It was suggested that these waters should be regulated to serve the irrigation of the

red-soil plains, some 40,000 acres of wash from the mountain to the south-east of the Ruwenzori foothills, instead of allowing them to waste by evaporation in the N'Songo swamps immediately to the north of Lake George. This country should be able to produce crops of cotton and valuable food-stuffs, as in the schemes which have proved so profitable in the Sudan. In addition it would provide an insurance for food supplies in the case of drought in other parts of the territory.

In those days these areas were too remote for practical development, but with the advent of a railway they may yet prove an asset.

On the route, especially on the escarpment above Lake George, there was practically no native population, nor traffic. Consequently I travelled through virgin country, where there was any amount of undisturbed game, not only plentiful but extremely tame. The animals provided the living interest in many "landscapes with figures". I remember one particularly beautiful scene at dawn, when I was camped near the edge of the eastern escarpment opposite the centre of the Ruwenzori, whose peaks and snows were some forty miles distant. As a rule these mountains are enveloped in cloud, and are rarely visible. On that particular morning, there was not a cloud in sight for the whole seventy-mile length of the range. The sun's first rays were just beginning to tinge with pink the highest point of the snows and glaciers, diamond-cut against the deep blue sky of the departing night, while the depths of the valley between were still shadowed in the grey before dawn.

For a couple of hundred yards to the sharp edge of the escarpment, the flat ground was clothed with new short grass of a brilliant green. Beyond that was space. On the top of a knoll at the edge of the drop stood a single stallion zebra, whose outline and bright stripes were sharply silhouetted against the darkness beyond. He seemed to be gazing with me towards the view of sunrise on the snows. Feeding on the new grass between my camp and the escarpment's edge were peaceful herds of buffalo, water-buck, and zebra. While it lasted, it was a memorable impression of untouched Africa, and one that has never left me.

When the field work of the reconnaissance was finished, I made my way back to the main Kampala-Fort Hall road, and camped late one afternoon in more inhabited country, near a native village, for fresh food supplies. Soon after camp was made, a shouting and yelling broke out from the direction of the village, and I sent a police boy across to find out the cause of the riot.

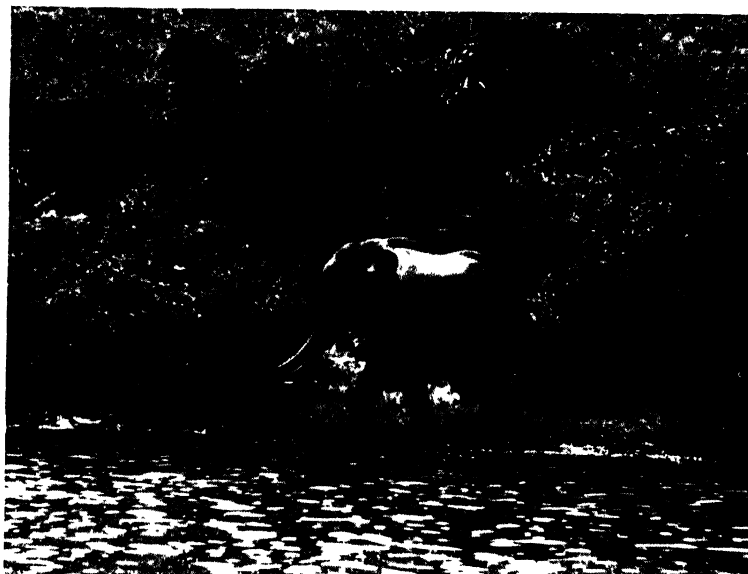
It seemed that an old man of the village had been out gathering firewood, when he was attacked by a python—in all my travels, the first case of this kind that I had heard of personally in Africa. The snake was a large one, and the old man was lucky to have had help at hand. A python will lie up by a path frequented by small game, and its mode of attack is usually to hit its quarry on the shoulder, dealing a hammer-like blow with its head, then follow up quickly while the victim is still off balance, and envelop it in its coils. On this occasion, it had struck the old man inside his thigh, half-way between hip and knee. His screams brought the other villagers out, and they were able to put the snake out of action before he could further damage his victim, though as I gathered it had been touch and go.

A procession eventually arrived in my camp consisting of twelve natives, six on each side, towing their booty in "V" formation, well away from the python's head, with bush ropes attached to the still struggling reptile's neck. The python, though full of assegai wounds, was still alive. Following the writhing mass was the limping victim, looking decidedly the worse for wear. I examined his wounds, which were not deep, but the flesh was torn in four places over a square formation of four inches, the upper wounds being the larger. I bathed the leg with antiseptic and applied permanganate of potash crystals, then gave him some strong tonic tablets. When I left camp next day, I examined the injury again. It was quite clean, and healing well, although the old man was still a bit shaken by the encounter. After that little episode, I returned to Kampala to finish up the work I had been doing, and prepare for the next part of the programme.

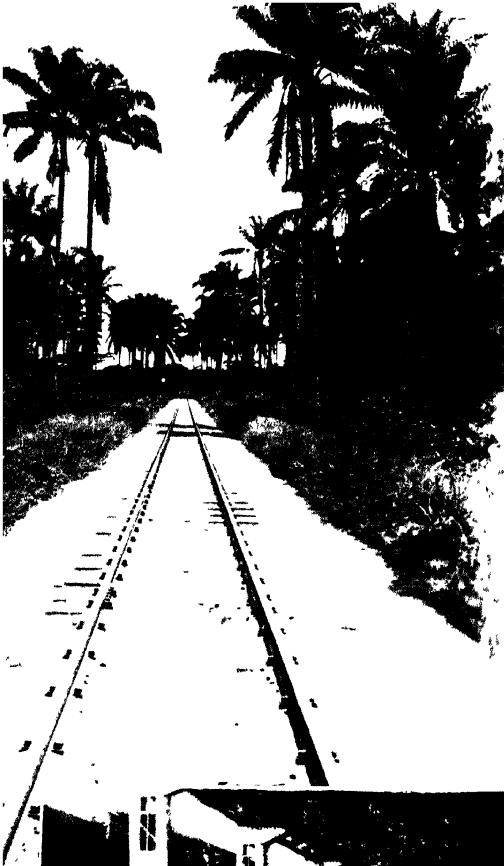
Robert Williams always held the theory, which had proved



“The python had struck the old man inside his thigh, half-way
between hip and knee.”



CONGO



Bas-Congo Katanga, part of the line near Mweke



so successful in the south, that Africa's major mineral deposits were to be found in the watersheds of the great rivers. Accordingly he had started prospecting parties under subsidiary companies of the Tanganyika Concessions, and these parties were then working in various parts of the Nile-Congo watershed, spreading as far as the Sudan in the north. My next effort was to investigate the possibilities of a line from Soroti, the northernmost branch of the Kenya and Uganda Railways, crossing the Nile at the only place where rock is in evidence, between Lake Albert and Nimule, and ending up on the Nile-Congo watershed near Arua.

The last effort was further to the north in the Southern Sudan; it took off from the highest navigable point on the Nile, then Rejaf, eight miles to the south of the present position of Juba, and followed a route via Loka to the watershed near Aba in the Belgian Congo. The actual route ranged not far distant from the main motor road between Aba and Juba.

Then, with my reconnaissance plans and the memoranda to accompany them, I returned to England to hand them over to Sir Robert. He invited me to accompany him to discuss them with the Permanent Under-Secretary of the Colonial Office, an ex-Royal Engineer officer, Sir Samuel Wilson, to whom Sir Robert handed copies of the various data and plans. Later I accompanied him to Brussels with such plans and reports as might concern the Belgian authorities on the possible connections between British territory and their own, and copies were also handed over to them.

With the exception of a short railway reconnaissance near the Tana River in Kenya in 1940, before the Italians threw their hand in during the second World War, this ended my connection with railways in Africa.

CHAPTER XII

GAME

As on all works in new countries, local interests and amusements were few, and there was little time to visit civilised centres, which, if they existed at all, were usually many hundreds of miles away. Health was of course the most important factor in this life of the bush, and as there were no facilities for any form of organised sport, there remained only an interest in game as a source of recreation and exercise.

Luckily for me, my tastes lay naturally in that direction, and my introduction to this fascinating subject could not have had a more propitious setting than the country of the Pungwe River near Beira, where there was an infinite variety for study. Here I had my initiation into big game hunting, and was able to draw on the experience of the many seasoned hunters in those parts. I was also lucky—although I did not think so at the time—in not being able to afford expensive high-velocity rifles.

I started shooting, as mentioned in an earlier chapter, with an old Martini of the sporting type, cast off by Dan Mahoney, one of the professional hunters. It was not very accurate, and the foresight was badly worn. However, when I had learned its faults, I managed to get all the meat I required, my shooting being for practical purposes rather than for trophies.

The old Martini taught me to stalk, and to approach as close as possible to my target so that I could shoot to kill. When there was plenty of other work to do, it was a serious waste of time to spend long hours following wounded game. I always like to think that I never let a wounded beast get away, nor did I leave meat lying unused, as sometimes happens when trophies are the chief consideration. I carried this gospel with me throughout my many subsequent years of the chase in various parts of Africa.

I was very fond of that old black-powder rifle, although, as recounted already, it let me down on occasions. Still, it taught me lessons remembered through the years—the lesson of hunting as opposed to present-day long-distance shooting with high-velocity rifles; and the lesson of hunting on foot, instead of chasing game the easier modern way, in motor transport.

In the earliest days of survey and construction on the original pioneer railways, some of the lines passed through the cream of untouched game country, which had either been inaccessible before, or else had suffered in competition with territories in easier range, where the species affording sought-after trophies were to be had with less effort. In the late 'nineties, and after the turn of the century, the Pungwe country was the most fashionable and the easiest of access, until it was superseded by the territories of East Africa. Southern Rhodesia was also well known, but not as easy to reach, while the countries of Northern Rhodesia, the Kafue River, and the Zambesi, were little known, and did not receive the attentions of sportsmen until the advent of the railways. Angola was even more obscure.

There was little information available on these newly-traversed territories, and no authoritative records of their fauna or flora. Although it was recognised that most of the larger species of game were certain to exist within their boundaries, there was always the chance of discovery of a new species to add to the interest. As the pioneer lines progressed through the various countries, I was able to contribute articles to *The Field* and other sporting journals, describing the different kinds of animal encountered on the way.

Angola on the whole was accessible to ox-wagon transport, and wherever the Angola Boers had penetrated on their trek from the Transvaal after the first Boer War, the veld was completely denuded of game. The line here did not show the same variety or quantity of game along its actual route as in other parts of Southern Africa, though there was plenty to be found many miles away to the north and south. However, several new species were brought to light during its development.

My article on Angola was included in a chapter of the Lonsdale Library of big-game shooting in Africa. This and other contributions aroused discussion, and attracted the attention of naturalists who were collecting for the principal museums of Europe and America, notably those of London, New York and Chicago. They were also of interest to specialist sportsmen engaged in the acquisition of rarer species.

At times it was possible to send live specimens of the smaller mammals to the Zoo in London, but the greatest interest in scientific circles centred on new discoveries. When these were obtained, skins and skulls were sent to the British Museum of Natural History in South Kensington for classification. Possibly owing to shortness of technical staff in those days, these were usually filed away with no recognition other than the official receipt and thanks, and no more was heard of them. The authorities were more interested in these small mammals than in the larger ones, as the small fauna of Angola were little known, and so far had received scant attention, while big game was supposed to vary little in different parts of the sub-continent. It was through this channel, though, that the Giant Sable Antelope of Angola was identified, and that almost by accident.

On one of my visits to London from Angola, I had taken to the curator of the Natural History Museum, Mr. Oldfield Thomas, specimens of a number of smaller mammals such as rats, moles, etcetera. He was extremely pleased with my selection, as it included a certain number of either rare or hitherto unknown kinds. I mentioned to him that in spite of the official lack of interest in the larger animals of this province, I considered that some of them showed a distinct difference from the classified varieties, and would repay a little study. I told him of a large sable antelope which I had already described in an article published in *The Field*, which differed in face-markings and other important respects from the ordinary sable antelope found in most parts of Africa, and as I knew it to be far larger than any they had in the Museum, I offered to present him with a specimen.

He welcomed the offer, and I accordingly sent him the head and skin, pointing out the differences, and suggesting that this might be a link between the common sable and the 60-inch single-horn that had puzzled Selous when he saw it in the Museum at Florence, the record measurement of the ordinary sable being then about 51 inches.

In due course I received a warm letter of thanks from Mr. Thomas, in which he stated that this was one of the most important gifts the Museum had received for a long time. At a subsequent meeting of the Zoological Society, the head was exhibited and the difference demonstrated between it and the common sable, *Hippotragus niger*. It was decided to name the new species after me, and it was duly called *Hippotragus niger variani*.

The habitat of these rare animals was a very small area in the fork of the Rivers Quanza and Luando, both fairly large and unfordable rivers, with the swamps of the Luaco River forming a further barrier to the south. They are found nowhere outside this area, which contains the only salt pans for many hundreds of miles around. The presence of these pans may account for the extraordinary development of this isolated group of sable antelope.

Just before my trip home at that time, some Angola Boers had managed to get their wagons across the swamps, and had shot a number of the herd for their skins and meat. This was a new treasure trove for them, as they had by then shot out most of the accessible game in Angola, and probably only the presence of the swamps had kept them off this little corner up till then. On my return, I heard that a large party had further designs on this newly-discovered source of meat, and intended to enter it as soon as the dry season permitted. This threatened the complete extinction of the finest antelope in Africa, bearing the most magnificent horns of all.

The Portuguese Governor of this district was a friend of mine, so I went to him for aid, telling him what was about to happen. He immediately closed the country for shooting; in consequence, I was naturally extremely unpopular with the frustrated hunters. Subsequently, when in London with

Sir Robert Williams and General Sir Joao Norton do Mattos, then Portuguese High Commissioner for Angola, for discussion of the reconnaissance plans of the Benguela Railway which I had recently completed and brought home with me, I asked Sir Joao if it would not be possible to make the Giant Sable Antelope royal game, and to afford the area in which they lived the closest protection. He was very sympathetic, and as we were both due to return shortly to Angola, he asked me to write him a full description of the species, and the district where they were to be found.

Shortly afterwards, this district was closed by decree both for shooting and entry except by special licence—and so it has remained ever since.

Soon after the issue of the decree, when the existence of these animals became more widely known, all the principal museums in different parts of the world applied to the Portuguese authorities for special licences, only obtainable from the Government in Lisbon, granting permission to collect specimens. I was allowed to collect one full specimen for the British Museum of Natural History, and one for the Chicago Museum. In 1925, Mr. Arthur Vernay brought out an expedition to collect these animals, and included in his party artists to construct the background of indigenous bushes and shrubs which now form the setting for the magnificent group in the Museum of Natural History in New York.

Another antelope which I brought to light in Angola, and which was subsequently named after me, was the Angolan Dik-Dik. This went to the other extreme; as opposed to the longest-horned animal in Africa, it is one of the shortest-horned. The record length of horn of the Sable is 65 inches, and that of the Dik-Dik $1\frac{3}{4}$ inches. This too is represented in the British and American Museums. There were other species for which I might have received the credit had not my early finds been so successfully pigeon-holed in some limbo of the Natural History Museum. Subsequent collectors took home certain varieties which were in due course named after them. When I was asked to collect further specimens, I discovered that I had already sent the identical animals years before,

but my "finds" had evidently been overlooked, and I had never received any further news of them—a little unfair.

Working in countries where encounters with game are part of the daily round, it is difficult to combine business with pleasure. One or the other must be sacrificed, and as my work was the more important, I could only treat hunting as a side line and indulge in it when meat was required. Consequently I went about as a rule without a gun or rifle. I suppose that during those many years of wandering through bush and veld on my lawful occasions, I saw far more game, both large and small, when I was without a weapon than I did when armed. This gave me an insight into two peculiarities of the relationship between man and beast.

There is an intuitive understanding among animals which seems to enable them to tell whether they are being hunted or not. I have not only noticed this in the case of man and animal, but also among animals themselves, in the case of the predatory and the prey, when for instance lions have walked in broad daylight close to grazing herds who have hardly troubled to raise their heads. The other curious phenomenon is the reaction of a man to his weapons, or lack of them. When unarmed, nothing appears to be dangerous; as soon as arms are carried, even the mildest creature seems to hold a menace. Of course, there are exceptions to this. A cow with a calf, separated from a herd, should always be treated warily, like a bitch with pups, when suddenly encountered. It is probable, however, that she is just as frightened as you are; once she has seen you off she will seldom press home the charge, if satisfied that you are safely out of the way and she can rejoin her young. A number of so-called charges are probably of this precautionary nature, but it is always difficult to be certain of this, and the result is usually that the unfortunate calf becomes motherless.

Normally it is very rare for an unwounded animal to make an unprovoked charge. The outstanding exception to this rule is the rhinoceros, who has bad eyesight, not very good hearing, and only his scent as a reliable guide. This is fortunate for man, as I have sometimes reflected when taking

ciné pictures. A down-wind charge has suddenly been terminated by the loss of the revealing scent, and the rhinoceros has gone blundering by as an agitated camera-man has skipped behind a sheltering tree.

The worst menace of all is a wounded buffalo, or one that is lying-up sick with rinderpest or some other trouble. There are no rules for his behaviour in these circumstances, as by the time he has reached this state he is generally very wicked, and has all his senses to guide him, with the additional advantage of being very quick on his feet, even *in extremis*. Once, near my camp on the Pungwe River, I entertained a young man whose first experience of big game was to find himself surrounded by a herd of buffalo—quite a usual thing to experience in that country at that time. In this plight he fired off in all directions and wounded a number of them, with the consequence that the district around was a perfect nightmare for a week or so afterwards.

I have several ciné close-ups taken with a 16 mm. camera at a speed of sixteen frames to the second. By counting the frames it is possible to gauge the length of time the buffalo stood facing the camera, and the extremely short time it took them to get on their hocks and wheel like a polo pony on the proverbial sixpence before disappearing in the opposite direction. On several occasions lone bulls have risen from cover and stood facing me at less than twenty yards. The only thing to do was to stand fast and face them, as it would have been fatal to turn. I usually put the camera up on these occasions, and the films record how long they stood their ground, and the speed at which they subsequently got away. Although I always had a rifle by me, I never once fired a shot when taking ciné pictures. Over the years, I have managed to acquire a fairly good set of films, in which every variety of game is represented.

Game photography with a ciné camera is an excellent cure for "buck fever", being very much more thrilling than mere slaughter. With present-day rifles it is possible to kill any animal, whether large or small, at a respectable distance, but it is necessary to stalk far more skilfully and approach very

much closer in order to get a reasonable picture with a 16 mm. film, using a 3-inch lens. This is the largest aperture that can be used without a stand, and that is not always satisfactory in eliminating shake, especially after a long stalk on a hot day. Anyway, things usually happen too fast for the use of a stand when one is after elephant, buffalo, or rhinoceros. Those are the animals most worth-while to the photographer, and are practically the only ones that must be approached on foot. Most other subjects can easily be photographed from the sanctuary of a motor car.

To fill the frame of a 16 mm. camera, using a 3 inch lens, it is necessary to get within twenty-five yards of an elephant, or twenty yards of a buffalo or rhinoceros, in order to achieve a satisfactory picture. Most pictures of lion are taken from cars in game reserves, where it is possible to approach very close indeed. Usually the lions don't object to motor traffic, and are quite amiable about it all, provided people are not rash enough to get out of their cars—in fact, they seem to like the interest they arouse. For example, in the Nairobi Game Reserve it is by no means unusual to see, in the late afternoon, a hundred cars or more lined up, with a group of twenty lions, lionesses and cubs, who will lie at ease a few yards away, or walk among the cars themselves without taking the slightest notice of their occupants. The sight is all the more intriguing as it can be enjoyed within view of the rooftops of Nairobi, barely five miles away.

The famous lion country of the Serengeti in Tanganyika Territory, now a National Park, has a wider range of game and a greater number of lions than possibly any other country in Africa with the exception perhaps of the Kruger National Park in the Transvaal. It was on the plains of the Serengeti that I was fortunate enough to be with Captain Monty Moore, V.C., when he was Game Ranger at Banagi in the heart of the lion country. For a radius of five miles from the Ranger's bungalow at Banagi, no shot of any description was allowed to be fired during the five years that Captain Moore was in charge. Consequently all the game in the whole area was extremely tame and unspoilt. Audrey, his wife, who shared

his life in that country, wrote that delightful and sympathetic animal book, *Serengeti*, in which she describes their animal friends and their experiences among them in those days.

During the second World War, when I was over age and not wanted for active service, Monty Moore was Game Warden at Arusha, and I spent some time at Banagi as honorary Game Ranger, acting for one who had gone on service. I was at the age when "the old preserve, the young destroy", and I then had the chance of seeing my charges at really close quarters. One of the Ranger's jobs, curious as it may sound, was the protection of the lions from native poachers. There was a neighbouring tribe, the Wakoma, living just outside the area of the reserve, whose ceremonial headdress was a lion's head and mane—a most effective costume when worn during a dance, with the manes waving in unison. To obtain their gala dress they had the unpleasant habit of descending on the reserve when opportunity offered, and getting a lion whenever they could by means of poisoned arrows—a habit which Monty had tried to break them of in no uncertain manner during his régime.

One family of lions lived in a patch of bush—when they were at home—on one of the rivers, a mile from the bungalow. They had been born and bred there, and Audrey had watched them grow up, as she mentions in her book. When I was at Banagi, the family consisted of a fine lion and lioness, a son, then nearly full grown, and three daughters. They used to come and go as they pleased, could be seen often from the bungalow, and even at times passed between the bungalow itself and the game-scouts' quarters by the river. The scouts and their families seemed to have no fear of them. One day, about five miles from the bungalow, I saw from the window of my car three other lions eating a zebra kill. I drove close up to them to watch the performance, and to get a picture. While I was thus engaged, the wife of one of the game scouts passed within 150 yards of us, by herself and quite unconcerned, with a bundle on her head—evidently returning from the only store, which was some ten miles away.

There was unlimited game for them to feed on, and when

they were not hunting they could be seen at times walking at quite close quarters through the grazing herds, which showed no sign of panic whatever. Their main headquarters was on an almost permanent stream of the Sayonera River, about ten miles from Banagi. Anywhere in the vicinity of this spot, the sound of a motor-car horn would bring some of them out, as they had learnt to connect it with the joyful prospect of meat, which on occasions had been thrown out to them. I have ciné pictures of them actually brushing against the mudguards of the car in order to pick up a tit-bit. Another amusing picture was taken by Monty Moore; it shows a full grown lion behaving like a kitten or a puppy, hanging on to a rope trailed behind a lorry, then, when the lorry engine is shut off, sitting back on its haunches and dragging the lorry backwards.

They were a friendly and amusing lot, and most interesting to watch at such close quarters. At times, if the sound of the horn failed to produce results, it was possible to find them by going out onto the plains and watching for vultures, of which there were many. If any of these vultures were seen to be descending, one was almost certain to find the lions just below, either actually feeding or having recently fed. All the larger lions were known by names, which Audrey Moore had given them. Some of them headed "prides" of up to twenty in number. There was great sadness when one was shot beyond the bounds of the reserve. It must have been an absolute "sitter" for the sportsman who killed it; he could not altogether be blamed, however, as he had not lived among them. Anyone who already knew them could no more have wished to shoot one than to shoot one of his own pets.

Lion-skins are and always will be fine trophies, and they are far easier to dispose of than those of the larger mammals. The latter are mostly unwanted in these years of grace, except possibly by the rich of other countries, who can afford the expense of mounting, and who have the space necessary for showing them off to advantage. Ciné photography explains the circumstances of the hunt far more vividly, and enshrines

the recollections of the hunter far more satisfactorily. The ciné camera is therefore to a large extent responsible for the waning popularity of the trophy as such, especially as its record can be shared by others, while a head on a wall conveys little except to the individual concerned in its acquisition.

Game-watching is another incentive not to kill unnecessarily. The study of the habits and ways of animals in their natural state has a fascination of its own, and the more one pursues this study, the less inclination there is to destroy.

In the earlier days, as my camps were situated in many different parts of Africa, most of the well-known big-game hunters and members of scientific expeditions either stayed with me, or passed through, providing me with many opportunities of exchanging ideas with them, and on occasion assisting them. Although at times there were accidents while hunting, it was surprising how few of the experienced hunters or game rangers ever got into trouble. Accidents were generally confined to beginners, who had little practical experience of the more dangerous game, and had made insufficient study of their habits. At times misfortune overtook men who should have known better, but suffered through carelessness in following too closely, or losing sight of, animals they had wounded.

One such case happened to a man who had been staying with me in my camp on the Kafue River in Northern Rhodesia. He had been opening up roads to the north for the Tanganyika Concessions for several years, and was due to go home on leave, when, he told me, he was going to be married. He left me to finish a road north of Broken Hill, saying that he would be back in a couple of weeks; but that was his last trip. The story was told me later by his boys. He had shot a hartebeeste in a vlei near his camp, and told them to go out and bring in the meat. They returned shortly afterwards with the news that a leopard was on the kill. He then went out himself, shot, and wounded the leopard, which made off into the edge of the bush surrounding the vlei. Leaving the boys to cut up the meat, he went into the bush after the animal, but evidently passed it. As he did so, it had sufficient strength left to spring on his back, throwing him forward. His rifle was flung out of

his hand, landing ahead of him, out of reach. In the subsequent struggle, the leopard destroyed most of his face before it died, practically on top of him. His cries brought the boys up to him, but they reached him too late. They carried him into the Broken Hill mine, but there was no doctor available, and he died the next day, principally from the blood poisoning which almost invariably sets in in such cases. I was told, however, that it was really a mercy, as his face was almost entirely gone, and he had been a very good-looking, upstanding man. The leopard was a very small one, judging from the size of its skin, which I saw later. It was his thirteenth—he had told me just before leaving that he had shot twelve in the years he had been out on the work.

Most of the incidents of a similar nature that came to my notice in those years, although not so tragic in their consequences, arose from the same cause, buffalo heading the list of the dangerous animals involved.

Of all God's creatures who dwell in the wilds, free to roam through the ages, the elephant is the largest and the cleverest. Although his range is restricted to certain areas, he is also the most sought-after, providing, as he does, not only the excitement of the chase, but a profitable return for all risks. Now with an ever-increasing native population and the consequent lack of sufficient land for cultivation, the elephant unfortunately has had to be confined to reserves, and to areas infested by tsetse fly and therefore useless for human habitation.

Both before and since the days of that great authority, Sir Samuel Baker, much literature has been devoted to the subject of elephant-hunting, all of it written by the world's experts in this field, out of their lifelong experience and from many divergent points of view. Latter-day experts of East Africa who come to mind are "Karamoja" Bell, Neumann, Blunt, and the well-known game ranger in charge of Elephant Control in Uganda, "Samaki" Salmon.

During the time this literature was produced, wide experience could be gained by the individual in the field, when ivory-hunting, with its accompanying slaughter, was uncon-

trolled. Experiments could then be made with a diversity of shots from every angle to determine by a process of trial and error the most effective—always a controversial subject—without seriously jeopardising the total bag.

With the exception of those engaged on the work of elephant control, nobody is now permitted to indulge in unlimited shooting. The novice therefore has to rely on the advice and the study of experts, or hunt under the protection of a professional hunter. As present-day licences only allow the shooting of two elephants, or, in some countries such as Uganda, possibly three, the holder of the licence is naturally out to get the biggest in the shortest possible time. This is a difficult job when experience, the only way of gaining real proficiency, is forbidden. Studying literature on the subject, no matter how conscientiously, is very much on a par with trying to learn golf in that manner. There is a lot to remember at the critical moment; but where elephant are concerned, things are apt to happen very quickly, and there is little chance of settling down to concentrate.

Continued chase of the elephant, involving great distances to cover and many obstacles to surmount, is possibly, with the exception of the pursuit of mountain-game, the hardest form of big-game sport in the world. There are sometimes occasions—memorable ones—when elephant are encountered without great effort in hunting or tracking; but these are “such stuff as dreams are made on”. A dream of this nature once came true while I was in Northern Uganda, but unfortunately I was not the dreamer. News had come to District Headquarters late one afternoon of elephant raiding a native “shamba” (field of crops) a few miles away. A young District Officer, recently out from England, with no previous experience of elephant-hunting, went off to sleep at the village in order to start the chase at daylight.

During the night, he was awakened by the villagers with the news that the elephant had returned, and were then close by. It was half-moon when he accompanied them to the spot. When the dim targets presented themselves, he fired hopefully at what he took to be the largest, and they then disappeared.

At dawn he set out again for the scene of action, and there lay a dead elephant, carrying a Santa Claus gift in the shape of two 75 pound tusks, worth at the prevailing value well over one hundred pounds sterling. Such sizes are rare in Uganda, outside the reserves.

When my work took me from Angola to Uganda, I was fortunate in meeting Captain R. J. D. Salmon, M.V.O., M.C. (universally known as "Samaki"), then Game Ranger in charge of Elephant Control in the Protectorate, and his wife Celia. The exploits of this remarkable couple and the hazardous life they led in the course of his calling, have been told in various articles which have appeared in *The Field*, *Country Life*, and other journals of the day.

"Samaki", in the course of his service, was credited with the destruction of between three and four thousand elephant. On one occasion he accounted for 40 in one day, 70 in three days, and a total of 230 in three weeks—dealt with in the most humane way possible, as only an expert like himself was capable of doing. This destruction was essential in order to thin out and drive back into their reserve a herd some thousands strong which had broken out of their confines and were devastating a whole countryside. Uganda is a small territory, with a rapidly increasing population dependent on a limited area of highly-cultivated land, where the invasion of such a herd was doing irreparable damage. It was estimated that the elephant population of the country was then over 16,000, with an annual increase of 12%. This necessitated drastic measures. These were carried out conscientiously by "Samaki" and F. Banks, assisted by an excellent body of game-scouts and guards which they had trained themselves. They performed their arduous duty with very little loss of wounded animals, and an extremely low cartridge average. It was not a one-sided affair either, as a number of the guards were killed, while others bore marks of serious encounters with elephant, buffalo, or rhino. Many tales were told of the intelligence of these elephants, and how precise their knowledge was of the limits of their reserve, once they had been punished for breaking bounds.

"Samaki" himself bore the marks of more than one conflict. On one occasion an elephant, luckily a one-tusker, got him down on the ground, and then attempted to drive its single tusk through his body, narrowly missing him. Eventually it got tired of trying, caught him round the neck with its trunk, flung him into a bush, and left him there. This little episode cost him six weeks in hospital.

He was a dead shot, and when in action, with his famous gun-bearer Musia to load for him, it was like the continuous fire of a machine-gun. On occasions when "Samaki" had been in such strenuous action he was almost deaf, with burnt hands, and a shoulder like a leg of mutton. He was a past master in the art of preventing a herd from stampeding, a thing they usually do at the sound of the first shot. Musia once had a whole page of *The Field* to himself as central figure in an article written by the late big-game editor of that journal, Mr. Martin Stephens, who described him as "The Prince of Gun-bearers".

Apart from his routine work, "Samaki" accompanied royal visitors when shooting in Uganda. Among those under his care at various times were King George VI and Queen Elizabeth, when Duke and Duchess of York, the Duke of Windsor when Prince of Wales, and the Earl and Countess of Athlone with their daughter Lady May Cambridge. Many others outside the Royal Family have also enjoyed the benefit of his experience and help.

Celia Salmon was a slight, fair, and reserved woman, who, when in London, had the appearance of never having left it. Even at the end of a long day after elephant, with all the exhaustion of it in that hot and uncomfortable country of Uganda, she never seemed to turn a hair. The possession of a cool courage and determination stood her in good stead in the life of hazard and excitement she was destined to lead in Africa.

During the period of that active life, of the forty to fifty elephant shot by her for ivory, under the annual licences, she hunted and shot a number by herself, accompanied only by her native tracker and gun-bearer. She was somewhat handi-

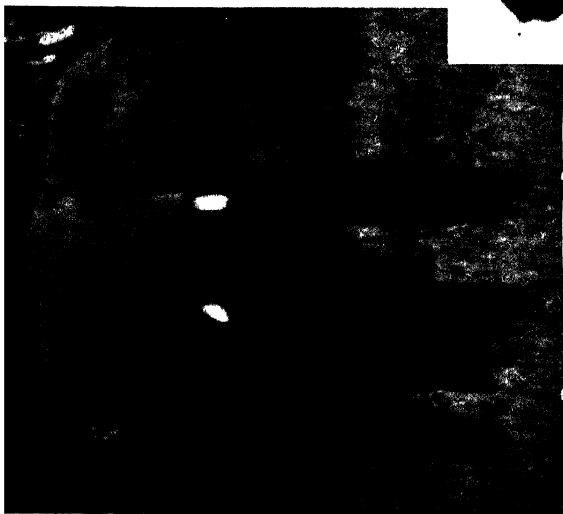


An old friend
posing at three
yards.



Pairs of lions
with kill.





Elephant in Uganda.



Celia Salmon, with her gun-bearer, Musia

A
bathing
party



capped by having to shoot with a light rifle, a Mauser .276, which had a right-handed bolt action, whereas she was left-handed. She was sufficiently expert to use the head-shot, a very tricky one at any time. Those who know this form of sport and its conditions, would acknowledge it to be a stout effort on her part. She was just as steady with a ciné camera, as shown by the excellent films she has taken at close quarters without a stand.

Martin Stephens went out to Uganda at one time on a short, intensive hunting trip arranged for him by "Samaki". He mentioned in a subsequent article that for several days "Samaki" was unable to go out with him, and in order not to waste time, Celia took on the job of white hunter for him instead. He remarks in a whimsical way how she took him up to elephant, rhino and buffalo in complete confidence, though quite ignorant as to how he might possibly have reacted in any sudden emergency.

The different zones where elephants dwell in Africa, whether dry or wet country, carry their own individual obstacles, usually in the type of vegetation. In Angola, in the dry coastal belt of the west, which is their main habitat, and especially in the feeding grounds of the Caporollo district which they frequent during the early rains of October, there is a dense scrub-type of sage-bush, about four feet in height, which is almost impenetrable except for the age-old elephant-paths. These paths are so well-worn and so clear that it would be possible to ride a motor-bicycle along their surface. The elephants themselves do not travel in the thick growth beyond the paths, but wander into it for food and shelter. When they are in this scrub, where the sage is mixed with a grey thorn bush, they blend in with the uniform dim colouring, and it is very difficult to distinguish them, even at short distances.

It was in that country that I saw, for the first and only time, an instance of elephant stamping on and killing another animal. The victim was a wart-hog and it was flattened practically into two dimensions.

In variety of country and obstacles which can be traversed

by a herd of elephant in the course of a day's tracking, Uganda is ahead of most other territories. Its specialities include the dense "elephant-grass" which grows to a height of ten feet, with stalks as thick as a man's finger, and the papyrus swamp, so much admired by visitors for its romantic appearance. It may prove necessary to cross and re-cross several of these swamps in the course of a day, floundering through a trampled and increasingly soggy mess in the wake of the herd. With the temperature in the neighbourhood of 90 degrees, and in a choking atmosphere more steam than air, they hold little romance at close quarters, and each one seems beastlier than the one before. Should one encounter the quarry after negotiating one of these hazards, as invariably seems to happen, there is a noticeable absence of that steadiness of hand and eye so desirable when confronting such a massive adversary.

This is where the "unforgiving moments" enter into it, to quote the title of Martin Stephens's writings on these subjects. Decisions have to be made quickly. Should the novice, following his study of the experts, elect to use the head-shot, angles and distances must be hurriedly called to mind, while a fervent prayer is offered that the sights may describe a circle of lesser radius, or that the small target may show a more co-operative attitude in meeting them.

One of two results will usually follow this decision. If the prayer is answered, the animal falls to the ground with his hindquarters sinking first, seldom to rise again. If not, dust flies from the impact of the bullet, and, with a stumble and shake of the head, the beast goes off, usually without waiting for any more, (though sometimes he may come the wrong way), In this case, the brain may have been missed by a fraction, the bullet passing through the large sponge-like mass in the dome of the skull without causing any damage other than pain.

Should the novice have followed the safer advice given by the experts, and taken the heart-shot, he will have had a larger and less mobile target to aim at. If his shot has found the heart, or the adjacent vitals, the beast, if not killed on the

spot, will usually be found a short distance away, with little or no chance of developing a further lease of life in the disconcerting manner of animals apparently dead but in reality only stunned by the head-shot.

That excellent body of men, the game-scouts, trained by "Samaki" on Elephant Control, were not permitted to use the head-shot, and had to account for the number of cartridges used, with the tally of tails brought in.

It was at the end of the last century that I fired my first shot at big game, near Beira. Since then, I have been a moderate rifle-shot, with a low cartridge average per head of game in general, when specimens or meat have been required. I generally managed to get close enough to know where the bullet was going, so as to save time and avoid chance shooting. My contact with elephant was only occasional, and for the same reasons I never attempted the head-shot with them; on the other hand, I never lost one.

When I was very young I lived in an atmosphere of big-game and elephant-hunting talk, as at that time my father was a well-known shikaree. During the late 'sixties and 'seventies he was Forest Officer for the Northern District of Ceylon, the country already made famous by Sir Samuel Baker in his books *Eight Years in Ceylon*, and *The Rifle and Hound in Ceylon*—both bibles of my boyhood days. At that time I despised anyone who had not shot an elephant as a poor sort of person—an opinion I was to revise later in life when I came to hunt them myself.

Surrounding me in England, when we first went home from Ceylon, there were many trophies of the chase, among them the skull and feet of the record elephant for Ceylon, shot by my father in 1882. For all I know this may still be the record. It was my father's 101st bull-elephant, and one of his last. He died soon afterwards at the early age of thirty-four, principally from the effects of various too-close encounters with elephant and buffalo.

The record of 100 elephants to a single gun was in those days, I understand, a large one for the elephants of India and Ceylon. Of course it does not compare with the bags of

the famous ivory-hunters and officers of Elephant Control in Africa, which run to thousands, but weapons in this case are very different, also opportunities. In India and Ceylon there was not the incentive of profit present in ivory-hunting as in Africa, and therefore no necessity to kill in excessive numbers. My father's records show that nearly all his elephants were single bulls which had turned "rogue", or "allian"—the local term he used. These were usually destroyed when they had proved themselves to be such by menacing a district. They were nearly all slain with a muzzle-loading black-powder .4 or .8 bore.

His record bull was known, when alive, as the "Malampe Rogue", as he had caused considerable damage in that district, and great loss of life, before my father put a stop to his career. He was killed by a single bullet, in a frontal head-shot, as the skull shows.

The frontal head-shot was a special point with my father and all the contemporaries who shot with him in those days. They all held the opinion that elephant should be killed in this manner and not "behind their backs". Many years after, the late R. Gordon Cumming told me this, while Lord Charles Beresford expresses the same opinion in his *Memoirs*, and also mentions his alarm when being led up to his first elephant, in position for this shot, by the tall Irishman, my father.

The "Malampe Rogue", or parts of him, travelled widely after his death. The skull is at present in a private museum in England. One foot went to the Museum at what in those days was St. Petersburg. The other forefoot won several prizes at exhibitions on the Continent and at home before coming to rest in the British Museum of Natural History in Kensington. I still have the tail, which has almost grey hair on it.

The frontal head-shot as used by the sportsmen of those days on the Indian elephant, with its concave forehead, would hardly have been possible on the convex forehead of the African elephant with the weapons then in use. It seems, though, that there were just as many arguments about the

most humane shots to be used in the killing of elephant then as in the present day.

When the late King Edward VII, then Prince of Wales, visited Ceylon in 1875 on his first big game expedition, my father accompanied him in pursuit of a variety of game which included his first elephant. At dinner one night, on board the *Serapis*, before the start of the expedition up-country, there was a discussion on the most effective shots to be used on various types of game, and the most likely one the Prince would have to use on his elephant. By way of illustrating his point on the head-shot, my father took a tumbler and put a walnut in it, then holding it up, he said, "That is about the proportion of the size of your target, sir." The rifle used by the Prince for his first elephant was a .8 bore, which had been a favourite of Sir Samuel Baker's. I saw it later on in England. It was a muzzle-loader with a long steel barrel, octagonal in shape on the outside. It had a comparatively small stock, with remarkably little balance, was fitted with one leaf-sight for eighty yards, and had been made by Bland.

The following account of His Royal Highness's first elephant appeared in one of the illustrated newspapers of 1875:

"... There were waiting for the Prince at Ruanwella, two renowned elephant shikarees, Messrs. Varian and Fisher (brother of the late Admiral Lord Fisher), men well acquainted with the habits of the animals.

After the first elephant had fallen Varian came to the Prince and told him how he had seen several elephants together going along the bed of a small stream, had fired and wounded one of them and how he thought His Royal Highness would be likely to see sport were he to come down and by penetrating through the jungle get a second shot at the wounded elephant. The Prince accepting this advice went on with Varian and Fisher and Lord Suffield, but got into quick sudden danger that had not been anticipated by his advisers.

As he advanced there was a crash in the bamboo jungle close by, and with a thrill of horror there came swiftly to Varian the conviction that the elephant—or there might be

more than one—was charging straight on the little party, almost helpless as they were owing to the impervious character of the jungle. He drew the Prince aside, just as the huge beast crashed by, quite near, yet invisible, and then with his heart in his mouth, for he and Fisher could realise the imminence of the danger just past, he put Lord Suffield behind His Royal Highness as coverer, while he and Fisher advanced in line with the Prince, cautiously and with great difficulty through the entangled and thorny jungle.

In an open patch close to the stream they came suddenly upon the elephant Varian had wounded. Fierce with pain the brute charged the party with fierce directness. The Prince and Varian fired simultaneously, and the elephant first sank on his knees, and the Prince standing forward gave him a ball just in the fatal spot. The great beast staggered sideways a little way, and then with a last scream rolled over into the stream, stone dead. . . .”

My father's favourite weapon at that time, and the one with which he did most of his shooting, was a double-barrelled muzzle-loading .4 bore, which took a four ounce spherical bullet, moulded round its circumference with a raised ridge, or belt. I once had the mould of it. The charge was one ounce of black powder. Although he was over 6 feet 3 inches in height, it occasionally put him on his back, with sometimes disastrous effect when facing charging animals. Such were the hazards of big game when shot with heavy charges, before the day of the present high-velocity weapons.

Now to return to Africa. I learnt a great deal more about the elephant from Alexander Barns, at the time when he stayed with me in Angola. He had then given up shooting, and taken to writing instead, but for ten years of his life he had spent most of his time as a professional ivory-hunter. In this period he accounted for more than seven hundred elephant in the Southern Congo and neighbouring territories. With the money he had gained from ivory, he settled down to farming and cattle-raising, but unfortunately, in his desire to remain near the wilds, he settled too close to the tsetse fly

areas. The consequence was that he lost all his cattle, and this ruined him financially. He described his loss as poetic justice in a way; the money he had gained by so much effort he had taken from the bush, and the bush in turn had taken it back from him.

When discussing elephant-chasing, he told me that he generally used the head-shot in the case of single animals, when there was time for another shot, but in dealing with numbers, he used mainly the heart-shot. He explained that on occasions he had lost good ivory through single head-shots. Leaving the elephant in question apparently dead, he had gone off after other members of the herd, to find on his return that the corpse had recovered consciousness and gone off. With the body-shot, he always reckoned to be sure of his animal. After all his adventures and narrow escapes in the heart of Africa, Barns was eventually run over and killed by a taxi, while on a lecture tour in Chicago.

One of my many elephant safaris with the "Samaki's" served to illustrate the uncertainty of elephant-hunting in general, and provided the last word, as far as I was concerned, in the controversy over the rival merits of the head and the heart-shot.

I was with "Samaki" while he was on a routine tour of various districts. He had decided to camp near the home of the District Chief, or "gombolola", and we arrived there at about eleven o'clock in the morning. We had just off-loaded the camp gear from the lorry when a runner came in to say that a herd of elephant had destroyed a shamba, or native field, about six miles away, during the previous night. They were evidently old offenders, who had already done great damage in the district. They were well out-of-bounds, and had been for some time past, so needed the attention of Elephant Control.

"Samaki" had recently written an article in *The Field* on elephant-chasing in Uganda, for novices; this had provoked a certain amount of discussion from others who were not as knowledgeable on the subject as he was. As I was not shooting, and had a ciné camera with me, I suggested that if we

got up to this herd, and he had to shoot some of them, it might be of interest to record the action of a head-shot, and its results. He agreed to this, and promised that if the opportunity occurred, he would give me a chance of getting a picture, then kill the remainder with the heart-shot as he had advised in his article. Though this may sound more like a nomination game than a prospective elephant-hunt, the sequel was anything but tame.

It was midday, and an extremely hot midday at that, when we reached the shamba and inspected the damage done by the raiders. In Uganda at that time of the year, a hunt starting at that time of day can be somewhat trying, what with the heat, the stubble of partly-burnt grass, and the presence of occasional swamps *en route*. This one was no exception, and most of the usual obstacles were encountered. Luckily on this occasion the herd were doubling back towards the scene of their previous night's damage. Musia, the famous tracker and gun-bearer, got busy on the not-so-fresh spoor. It was an education to watch him at work and to see him pick up without fault, hesitation, or loss of time, the track where the herd had moved on again, from the criss-cross of old and new spoor marking the places where they had stopped to feed or rest.

The herd had evidently kept on the move ever since the previous night, and by the way that we went, they had covered a good deal of ground. We were hard at it without a stop until we came up with them at four o'clock, and then they were still on the move—a herd of thirty, mostly bulls, and none carrying ivory of value. A fifty-pounder would have been about the biggest. At this point they were back within a mile-and-a-half of the shamba they had raided the night before, and were probably preparing to descend on it again.

"Samaki" decided that the punishment to be meted out, not only to thin the herd but to drive them well away from the district and into their own country again, would entail the loss of about half a dozen of them. The country where we found them was one of heavily-wooded antheaps, thickets of

dense bush, and open glades forty yards or so in width—not an easy one for the work in hand.

As we approached in accordance with the direction of the wind, we saw a bull with tusks of about fifty pounds, standing rather apart from the rest of the herd, who were still moving on in ignorance of the impending danger. It was this one that "Samaki" selected for our demonstration film. I focussed the camera on it at a distance of some twenty-five yards, and watched through the view-finder the achievement of an apparently perfect head-shot. The elephant's hind legs buckled, gave way, and sank before the front ones—the desired result of a destruction so instantaneous that the beast knows nothing of its fate.

I remarked on this to "Samaki". As soon as the shot was fired, the herd began to head in my direction, so I crossed over past him, and took up my stand for the rest of the performance, leaning against the body of the newly-shot bull. It lay very still, the only immobile object in the midst of chaos. The herd was bunching up from various quarters, milling around in a pandemonium of dust and angry screaming. "Samaki" was then getting into his stride, and shooting with such rapidity that it sounded more like a machine-gun than a single rifle. He was dealing with selected animals, using the heart-shot as he had said he would; in fact, in the dust and confusion, it was the only practicable method. The show was soon over, as on this occasion it was only a disciplinary measure, involving a mild thinning of the herd. When this had been effected, the remainder were allowed to get away. At other times, when he had to decimate a herd and clear a district completely of the offenders, he used strong measures to prevent any escape, which called for great energy and rapid judgment.

After the bedlam of the shooting and the screaming, a great silence descended on the scene with the departure of the herd. It had been hot work while it lasted, and we drew breath to survey results.

The original bull, killed as we supposed with the head-shot, was lying about forty yards away in a small glade, out of sight

of the others. In another glade, three lay together within a radius of twenty yards. There was one at forty yards, and another at eighty yards, making in all a total of six, as originally decided, and all killed with the heart-shot.

"Samaki" went up to inspect the outlying animals, while I discarded my jacket and the rifle I had been carrying for my own protection, laying them on one of the three elephants grouped together on the ground—a thoughtless act on my part, even in the prevailing calm. I took my camera from one of the three Africans who were with me, and went over to a near-by anthep, where I sat down to view the theatre of events, and adjusted my camera in order to record it. The Africans were interested spectators. On my left lay the three elephants—and my rifle—some fourteen yards off. In front, about the same distance away, was a patch of thick bush, ending on the right in a wooded anthep. Beyond this, and further to the right, was an open glade, with a thick dark green wall of equatorial forest terminating the view. That was the backcloth for the next act in the drama.

I was proceeding with the adjustment of my camera under the fascinated gaze of my audience of three, when without any warning the silence was suddenly broken by a burst of angry screaming, accompanied by crashings in the bush ahead of us. There was nothing to be seen as yet, but the Africans gave a yell and made off down to the right and round the anthep in full cry. From that point they could see what was happening, which was quite sufficient to make them shoot like scalded cats up towards "Samaki", who was about eighty yards away. Picking myself up, I decided to follow their example, (although I had not grasped the nature of events as quickly as they had), at any rate to the extent of retiring to the other side of my anthep in order to see which way the storm was breaking. My rifle was over in the direction of the oncoming trouble.

The intention was good, but as I started to put it into execution, I caught my foot in a trailing vine, took a toss, and fell full-length on my face. I lay there only for the matter of a split second, but in that short space of time, while

stretched out on the floor of Africa, I felt exposed and helpless as never before or since. I was clad in a very light-coloured garment. The icy consciousness of my conspicuous appearance swept through me, together with a singular feeling of extreme loneliness, in the presence of that hostile noise. After all, the best of cameras is in such circumstances a very inadequate form of defence.

I rolled over quickly, and saw the source of the disturbance. It was not a herd, as one might have supposed from the noise, but a single bull-elephant that shot out, twenty yards away, past the anthheap on the right from which the Africans had recently and prudently retreated.

It is probable that he had caught a glimpse of them in their flight, and that had decided his line of action. Action it certainly was, and from the angle at which I viewed it, he presented a very fine sight. The picture resembled one of those old animal-prints, which in the past had seemed to me to be so exaggerated. He was fully extended, and going all out in fine style. He had his head well back, tusks up, and trunk over his head, while the great ears were standing out like sails on either side, and his tail stood out behind him as stiff as a rail. He thundered straight for the dark wall of the forest on the other side of the open glade, and without hesitation dived into it and disappeared into Darkest Africa. Whether it was a frightened get-away, or an extremely angry elephant in full charge, it would have been difficult to say. Either way, it was much better viewed from behind than in front.

The Africans reached "Samaki" green in colour, as he told me later, and gibbering that a new herd had broken out and tried to eat them, but had eaten me instead. When he came down to find out what was happening, I could only tell him that it was not a herd, but a single very angry bull who had suddenly appeared from nowhere, and had departed in a hurry into the bush on the right.

We walked round to inspect the bag, and found each animal well and truly shot in the approved body-target. We then went to see the original elephant who had acted as film

star in the head-shot episode. He should have been lying out of sight in the glade beyond, but when we came to explore it, there was no sign of him. Obviously he had been the cause of the recent dramatic disturbance. As I had not only been standing beside him, but had even leant against him while he lay motionless and to all appearances dead, it was not surprising that I had not connected him with the extremely lively apparition that had later broken out from the bush.

It was evident that "Samaki's" shot had only stunned him. On coming to, he must have decided that our party was a little too rough for him, and that it would be better to give it a miss. Before going, however, he made his contribution in the shape of an excellent imitation of an entire herd stampeding in the bush—an act which was a little too realistic for the comfort of his audience—winding up with the brilliant impersonation of the "Cheltenham Flier" entering a tunnel. It was all a great surprise to "Samaki", as that sort of contretemps did not usually befall him. When the film was shown, it recorded the collapse of that elephantine star, felled with a perfect head-shot. The sequel was not given.

"Samaki" told me of a similar incident concerning a man he had taken out with him one day on the chance of getting an elephant on his licence. He took him up to a good bull, and placed him in position for the shot, while he himself went after another farther on. The sportsman duly dispatched the bull with what he imagined to be a correct head-shot. He spanned and roughly measured the ivory while it was on the ground, and then went off to tell "Samaki" the good news of a possible 75-pounder. When they returned to inspect it, this Elijah of an elephant had gone, never to be seen again. Even then the luckless fellow could not believe it, and continued to argue: "It was *stone* dead—it must have been, as I measured it so."

It is possible that more unpleasant endings await the African elephant than any other animal. When cleanly shot, they are really quite fortunate in their fate, as other methods employed to finish them off, particularly the methods of native

hunters, are decidedly not nice. Luckily in latter years, since the advent of white administration, these methods have been severely discouraged.

One native technique employed by tribes in Northern Uganda and the Southern Sudan, consisted of surrounding a small herd in the thick elephant-grass of those countries, and then firing the grass. The unfortunate animals that failed to escape had their feet and trunks badly burned, which meant that they could not travel, neither could they feed. This made them an easy prey for the spears of the natives, although there was a certain mortality among the hunters at times, by way of retribution. Poisoned arrows, and pit-traps which were well concealed on their paths and equipped with sharp stakes for them to fall on, were the cause of many lingering deaths. Another unpleasant method was the use of foot-traps, which were as devilish as they were cruel. They consisted of a strong rim, three to four feet in diameter. Bound to the edge of this were stakes of hardwood, sharply pointed and converging towards the centre. This was placed on an elephant path, and when the animal put his foot inside it, the spiked points bit deep into his ankle and became fixed with such tenacity that he could not remove it. Attached to the rim by a strong bush rope was a log which stalled the beast until it was caught and speared, usually by then with an agonising festering wound caused by the trap.

Quite a number of elephants died accidentally through collision with engines or trains. Such incidents have been recorded from time to time in various parts of Africa. One of the worst I knew of was a collision between an elephant and a construction train on a curve, during the building of the line between the Victoria Falls and Broken Hill, at a point near Kalomo in Northern Rhodesia. The elephant fell across the newly-laid track, while the impact derailed the engine and part of the train. It was a sad business, as the poor beast lay there, very badly wounded and unable to move, while no rifle or other means of dispatching it was available for many hours. As the contract rate for the construction of the line was for a mile a day, the line had to be deviated

around the carcase and derailment, with the aid of material carried by the wrecked train.

There is little doubt that as long as there are elephants to be shot, the controversy on the correct method of killing will continue. Like most other problems that arise in the course of the day's work, however, the solution will be found under practical conditions rather than in theory.

L'ENVOI

My last work in Africa, though in no way connected with the preceding story of Pioneer Railways, was still a contribution to the development of the continent, though in a different sphere.

I was in Kenya at the outbreak of the second World War, many years after the completion of my work with the railways to the south and west. I was too old for active service, but there, during the earlier days of the war, I was responsible for the location of a new alignment on a section of the Cape-to-Cairo trunk road over a distance of some thirty-five miles between Nairobi and Lake Naivasha. This section included the precipitous drop of the eastern escarpment into the Great Rift Valley. It was an interesting commission, and when finished, superseded the steep descent which had served as a road since the earliest days of the Colony, and which had been the cause of so many serious accidents in its time.

At first the new road was known, though unofficially, as the "Varian Way". And that was the swan song of a long life spent mainly in the cause of the development of Africa, and, to use Alexander's expression, in the achievement of "de work God gie 'im."

The half century which saw the beginnings and the expansion of the Pioneer Railways over half a continent may well be designated by future historians as the period of the most rapid growth and change known to mankind. This period witnessed the passing of the last of the great adventurers, while at the same time the British Empire they had done so much to build passed the peak of its wealth and grandeur into the decline which has gathered such frightening momentum in recent years.

The rapid advance of all the sciences increased the whole tempo of living, particularly in the field of transport. At sea, at the beginning of that era, sail was still in partial use, on

mail-packets, and even in the British Navy. The turn of the century ushered in the age of petrol, leading to motor traction, aeroplanes, and submarines, with consequent conquest of the great distances of the earth, the air above, and the waters below. In backward countries, such as I have described in the course of this sketch, the native-carrier and the ox-wagon gave place to railways and motor transport. The firestick and the foot-messenger were outmoded. Electricity followed gas in centres of civilisation, and electric power came to lighten most corners of the dark continent. Telephones became a commonplace, and were followed by the new miracle of radio. In ballistics, black powder gave place to high-velocity weapons, thus hastening the destruction of Africa's vast herds of game.

In such a limited survey as this, extending over more than thirty years spent in the construction of more than 3,000 miles of railway, through territories in the beginning largely unknown and almost untouched, it is only possible to give the barest outline of the facts concerning the lines themselves, together with a few of the incidents, personal and otherwise, which went to form the interest of an eventful life.

Looking back on this life, I consider it a privilege, in those not misspent years, to have added my efforts, however small they may have been, to the history of the opening-up of Africa.

Treasured recollections there are many, times of loneliness, a few; there are some hardships, and many friendships, all of them combining in that kaleidoscope of contrast which makes life worth the living, and all of them invested with that magic felt by all who knew Africa in its days of primitive simplicity and silence—a magic that is now, alas, no more.



Hippotragus niger
variati.

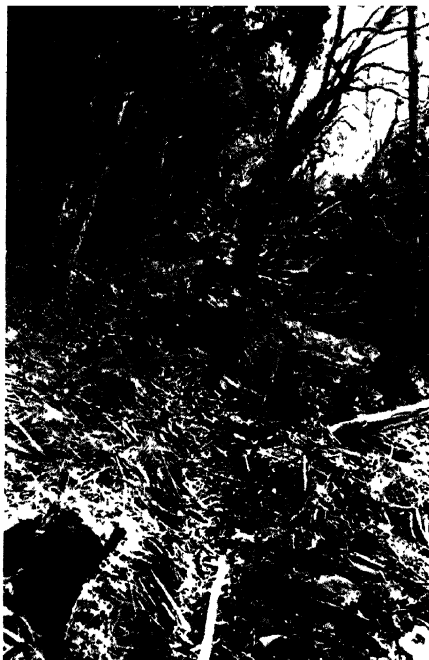
Specimen collected
request for the Field
Museum, Chicago.

specimen secured
by Mr Arthur
S Vernay.





Photo by permission Natal Mercury



Way" during construction.

was the swan song of a long
ianly in the cause of the development of Africa."

Photos by Kenya Information Office



APPENDIX A

DURING the eleven years between the commencement of the Rhodesia Railways from Vryburg in May 1893, and their arrival at the Victoria Falls in April 1904, the Company's engineering staff, representing Sir Douglas Fox and Partners, and Sir Charles Metcalfe, Bt., the consulting engineers in London, was headed by Mr. S. F. Townsend. Mr. Townsend was originally on the staff of the Cape Government Railways, and while with them was responsible for the construction of the Orange River Bridge, then the longest bridge in Africa. He was appointed to the Rhodesia Railways by Cecil Rhodes, on the start of the great scheme from Vryburg, and continued with the company as Chief Resident Engineer until after the main line reached the Congo Border in 1909.

The contractors for most of the line were the famous firm of George Pauling & Co., Ltd., of Westminster, who had been responsible for many of the railways in the Cape Colony. They were not only contractors, but, with the financial group of Messrs. Erlanger, assisted in part in the financing of some sections of the line. Their work extended from Vryburg to the Congo border, then afterwards in collaboration with the Belgian authorities, from the Border to Elisabethville. Other works included the section from Beira to Bulawayo via Salisbury. In Angola they were the contractors for the construction of the line from Mile 120 to the Portuguese-Belgian frontier at Luao. Altogether, they were contractors for some 2,912 miles of main line, apart from branch lines, in the various territories north of Vryburg.

Mr. W. Tower was chief assistant engineer to Mr. Townsend, and in charge of most of the surveys north from Vryburg. He was head of construction between Bulawayo and Salisbury, and on part of the line from Bulawayo to the Victoria Falls, where he was eventually Resident Engineer for the construction of the bridge. As assistants at the start

of the works, he had Mr. C. Everard and Mr. Beresford Fox, a son of Sir Francis Fox, one of the consulting engineers in London. Fox was a keen mountaineer and this enthusiasm was another link in the chain that continued to bind me to Africa. While trying out some of the cliffs near the site of the Victoria Falls bridge, he slipped and fell down the face of the crag between the bridge site and the "Boiling Pot" on the south bank. Luckily his fall was broken by a few small shrubs which supported him until rescued by a party descending from the top with ropes. He sustained several fractures, and altogether was so badly shaken that he had to be invalided back to England. I was sent out to take over his job. In August 1904, I reported to Mr. Townsend at Bulawayo, and so on to Mr. Tower at the Falls. By that time, the construction of the bridge was well in hand.

The dimensions of the bridge were: main arch 500 feet, with a rise of 90 feet; the approaching land spans at each end, 66 feet; the width of the original decking, 26 feet, carrying a double track of rails, of which only one was used, and two foot-ways; the height of the imposts at each end, 105 feet; and the total weight of the steelwork, 1,500 tons. Since the original construction was completed, the decking with the double track of rails has been removed. The bridge was then widened, and raised 4 ft. 6 ins. to carry a single track of railway, roadway and sidewalks. One of the highest bridges in the world, it is 350 feet above low water in the gorge below, which corresponds approximately to the height of St. Paul's Cathedral from the pavement to the top of its surmounting cross.

The altitude of the original rail level above sea level was 2,876 feet, and it was then 15 feet below the average lip of the Falls.

The steelwork was designed by Messrs. Hodgson and Freeman, of Sir Douglas Fox and Partners. Mr. Freeman, afterwards Sir Ralph Freeman, was the distinguished engineer later responsible for many of the major bridges of the world, including the famous one across Sydney Harbour, Australia. The contractors for the construction and erection of the steel-

works were the Cleveland Bridge Co., of Darlington, Yorks. Their agent and engineer in charge of the field works and erection was a young Frenchman, Monsieur Imbault, of exceptional ability, who was afterwards on the erection of the bridge across the Nile at Kosti, south of Khartoum.

APPENDIX B

THE mileages of the main lines in the different territories concerned are approximately as follows; though there may be some minor differences owing to shortening of their alignments at various times:

	Miles (Section)	Miles (Total)
<i>In the Cape Province of the Union of South Africa:</i>		
Vryburg to Ramathlabama ... ..	...	112
<i>In the Bechuanaland Protectorate:</i>		
Ramathlabama to Ramaquabane ... ..	...	394
<i>In Southern Rhodesia:</i>		
Ramaquabane to Bulawayo	65	
Bulawayo to Victoria Falls	280	
Bulawayo to Umtali	470	
	—	815
<i>In Moçambique Territory:</i>		
Umtali to Beira ... ..	...	200
<i>In Northern Rhodesia:</i>		
Victoria Falls to the Congo border ... ..	...	516
<i>In the Belgian Congo:</i>		
From the border (Sakania) to Port Francqui	949	
Tenke to Luao, Angola Frontier	219	
	—	1,168
<i>In Angola:</i>		
Luao to Lobito Bay ... ..	...	835
	—	
<i>Total Mileage</i>		4,040

Most of the financing of the various sections of these railways was done by companies of the Chartered Company group, while other sections, although connected with the main chain,

were financed by companies in no way connected with it. The companies concerned were:

The Mashonaland Railway Co. :

Umtali to Salisbury.

Kalomo to Broken Hill.

The Rhodesia Railway Ltd. :

Vryburg to Bulawayo.

Bulawayo to Salisbury.

Bulawayo to Victoria Falls.

Victoria Falls to Kalomo.

The Beira Junction Railway Co., Ltd. :

Beira to Fontesvilla (Ponte da Pungwe).

The Beira Railway Co., Ltd. :

Fontesvilla to Umtali.

The Rhodesia Katanga Junction Railway & Mineral Co., Ltd. :

(*The Tanganyika Concessions Ltd.*)

Broken Hill to Congo Border.

B.C.K. Bas Congo Katanga Railway :

Congo Border (Sakanian) to Tenke, and Port Francqui on Casai River.

L.K.D. (Leocardie) :

Tenke (B.C.K.) to Angolan-Belgian Frontier at Luao R.

Companhia do Ferro de Benguela (Benguela Railway Co., Ltd.) :

Luao to Lobito Bay.

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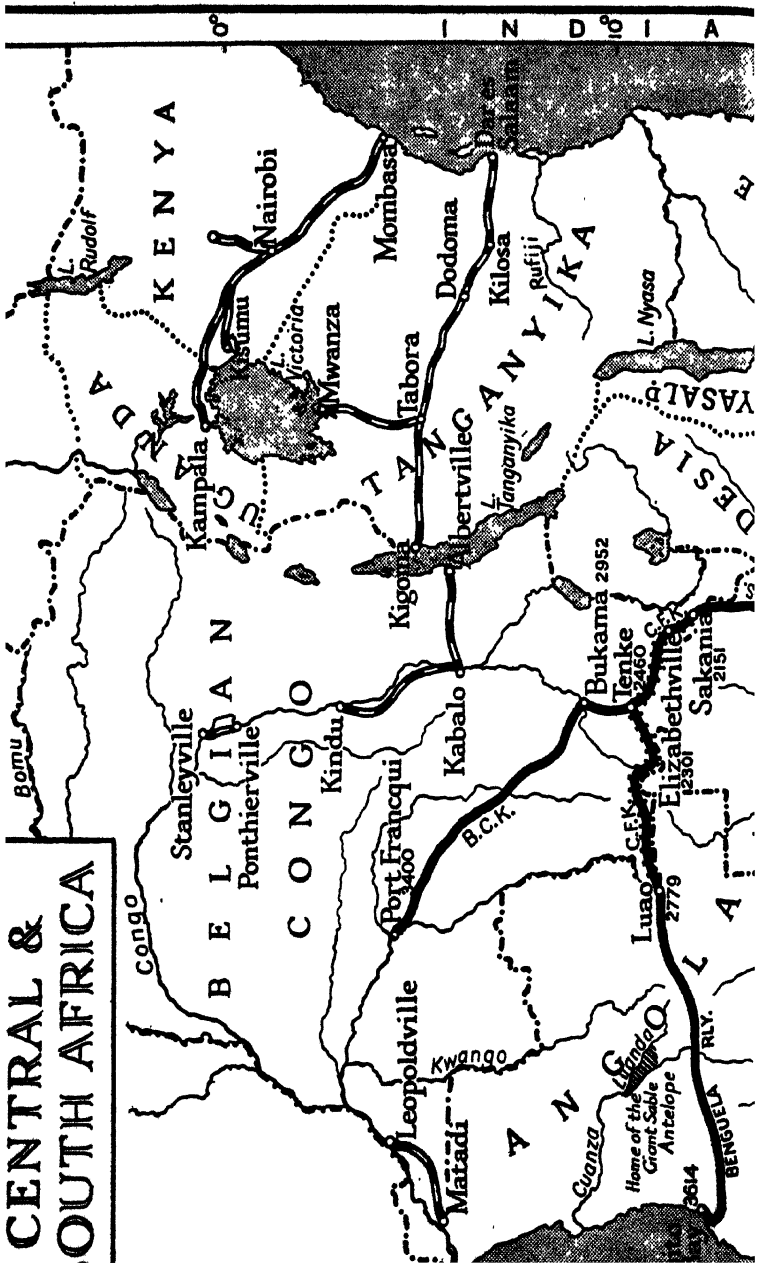
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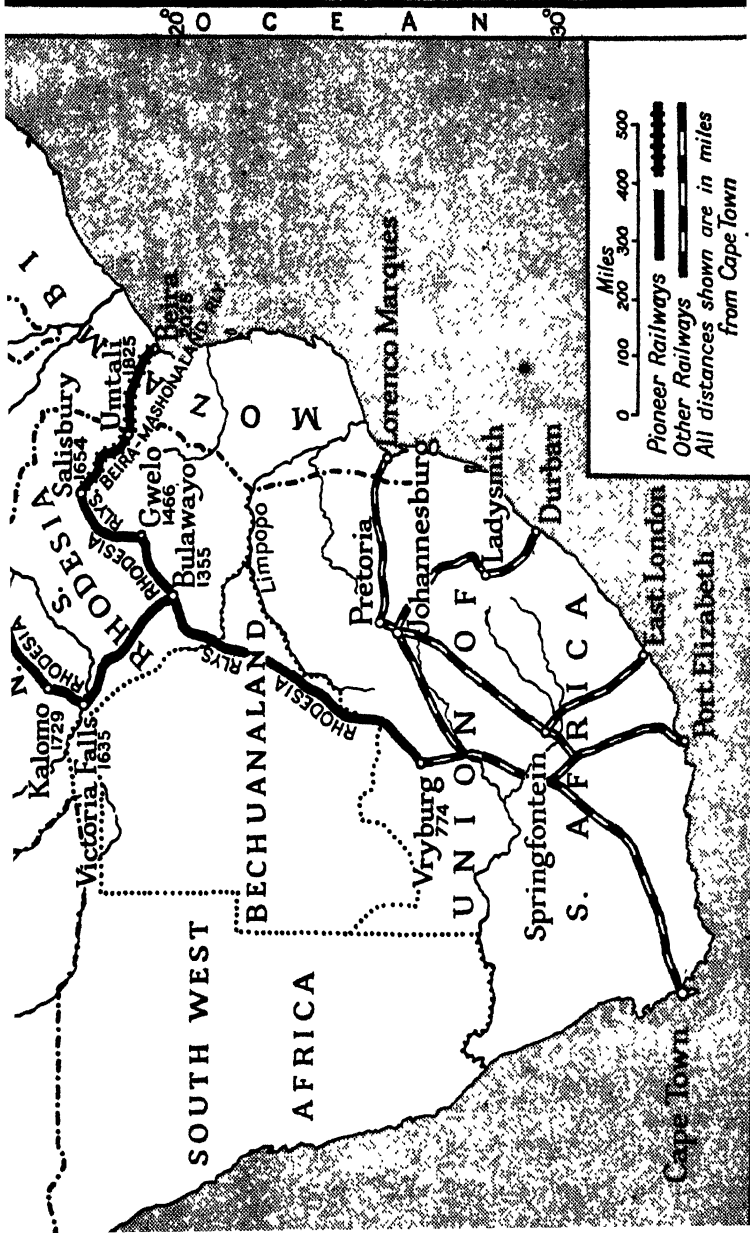
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